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☞ The *Mechanical Engineering* department of this paper will be under the charge of Mr. ZERAH COLBURN.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., No. 9 SPRUCE ST.

Saturday, July 16, 1853.

Railroad Negotiations.

New Orleans, Jackson and Great Northern Railroad.—Mr. James Robb, President of the above company, recently sailed for England for the purpose of negotiating its bonds in the London market.

The length of the road is 410 miles, and will cost at the best calculation $30,000 to the mile or $12,300,000. The means provided are as follows—

Subscription of City of New Orleans	$2,000,000
" " State of Louisiana	1,600,000
" " Counties	717,600
" " Individuals	458,525
" " Contractors	20.000
	$4,976,125

The surveys of the whole line are not yet completed. A small portion of it only has been placed under contract. The whole amount expended thus far in construction is $68,127.

The city subscription is met by a tax upon the real estate of the city of one-half per cent., which will produce from $350,000 to $400,000 annually; distributing the payments through six years. By the terms of subscription on the part of the State. only one half of the subscription will become due by the first of January, 1859. The full payment of the latter subscription may never become due unless the capital stock should be increased to the amount of $8,000,000. The payments of the County subscriptions are distributed through a series of years, none being made upon less time than 5. Upon this basis Mr. Robb goes to London to negotiate a loan of $6,000,000, to carry forward the work.

Now, admitting the importance of the work to the city of New Orleans, and its prospective value as a commercial enterprise, it strikes us that the present attempt to negotiate a loan to the amount of $6,000,000 is premature, ill advised, not justified by the financial condition of the company, and very likely to end disastrously, rather than to be productive of really beneficial results.

We are opposed to the policy of building railroads entirely upon *credits*, as this road is proposed to be built. Our objection is not a new one.—We have watched with care the recent movements of New Orleans, and more than two years ago we pointed out the dangers into which she was likely to fall. We took the ground that municipal corporations were incompetent to the task of constructing and managing railroads, which are commercial enterprises, and can only succeed by bringing in aid of their management private interests and individual sagacity. Where the management of a railroad, or any similar work, is entrusted to the officers of a municipal corporation, the immediate interest they have to make all they can out of the work as it progresses, or their position in reference to it far outweighs the more remote and contingent good they may have at stake; and experience has proved the rule to be universal that such work will be *mismanaged*. Take the case of Pennsylvania. The construction of her public works has been but one scene of profligacy from beginning to end, and it is now a grave question whether the State would not be better without, than with them. There is an immense amount of venality and corruption in the management of the Erie Canal in this State, which would be as glaring as in the case of the Pennsylvania works, did not its immense revenues hide the multitude of sins that are committed; It is notorious that "Government work," as it is called, costs twice as much as would a contract put out by an *individual*. The reason is obvious. In the latter case the *gains* are measured by what can be *saved*; in the former by what, as far as Government is concerned, can be *wasted*. Such is the case with all work where *private* interests do not act as guard over expenditures.

The policy we urged upon the people of New Orleans was to provide a very large individual stock subscription as the basis of any loan they might be obliged to make. Suppose the road to cost $12,000,000, at least one-third of this sum should have been *private* subscriptions. Such amo't would have required at least 5000 stockholders, each of whom would have become not only a firm friend of the road, but a vigilant committee of safety, always on hand to defend its rights, and to maintain its interests. Each person would feel every cent lost, to be *his* loss. The stockholders would scrutinize every act of the directors, and their vigilance always excited would operate as a wholesome check upon any unadvised or unwarranted step. In such case nothing could go wrong, without being brought to light, and the spirit of inquiry investigation aroused, would bring to the aid of the directors the best talent and ability in the whole community. Where the majority of a community were stockholders, they would be able to create a public feeling in favor of a work which would be of incalculable value, in a pecuniary point of view. When, on the other hand, *individuals* are not interested in favor of, they will be against a railroad, and this fact alone often adds vastly to its cost in the increased cost of many of the more important items of construction.

We advised the people of New Orleans to pursue the same course that their sister city, Mobile, has done. *That* city, only one-sixth the size of New Orleans, undertook, single handed. the construction of a much greater work, the Mobile and Ohio railroad. By the adoption of a proper policy the completion of this great work is now not only

secured, and that too at an early day, but the whole has been rendered a task of as little difficulty as would have been the construction of fifty miles of road. As is the case with the New Orleans, and Great Northern, the line of the former traverses, for the greater part of its distance, a country possessing sufficient local means to prepare the road bed for the iron. Its managers laid it down as an inflexible rule that they would put no part of the road under contract, only so fast as the local population would provide the means of graduation. No difficulty whatever was found in securing the proper pledges from the proper parties, as soon as they were made to understand what was expected from them, and the work upon the entire line is now making the most rapid progress from *local* means alone; and when the work of graduation shall be completed, the company will find capitalists ready to take their bonds and furnish them with the balance necessary to complete the road upon most favorable terms. But these are not all the advantages resulting from the policy adopted in the case before us. The road, in a great measure, has become the common property of the community it traverses. It has taken strong hold on the confidence and affection of its stockholders, which is bringing into its management the best ability that the country affords. It serves as a means of educating the whole community interested upon the subject of railroads their influence, mode of construction, management, etc., etc. Such are the results already achieved to a very considerable extent upon the line of this road though the influence it is destined to exert, is hardly begun to be felt.

These remarks may seem of too general a character to have much bearing upon any particular case. But they are applicable to all cases. We are not only opposed to building railroads entirely on credit, but we think it a great misfortune for any company to obtain this credit easily. If an individual who borrows a sum of money pledges an equal value as *Security*, he wastes his own means by wasting his trust. In such case the indebtedness he creates has no tendency to render him extravagant. We want to see Railroad companies placed in the same category. Their managers should have a direct and immediate interest in the *result* of their acts. This must be the case to secure an economical administration. Money that comes easily, is always expended lavishly. Take the case of the Erie Railroad company. As soon as they found they could have money for the asking, it went as freely as it came. It is not too much to say that a sum larger than its present Capital Stock has been lost outright; sunk:—The legitimate result of building a road upon *credit*, and one that could never have happened had one half the cost of this road been raised by, *Stock* subscriptions.

The credits of municipal corporations should only be resorted to in the case of eminent necessity; only to susply what may be lacking private enterprize shall have exhausted its means. In such case, such corporations do not become direct parties to such works, and no injurious result follows. When, on the other hand, the credit of corporations are resorted to in the *outset*, its effect is to completely destroy all public spirit. It completely emasculates it. When *individuals* feel themselves released from the necessity of aiding an enterprize by the action of a city in its corporate capacity, they can never be brought up to the work byany subsequent effort.

Suppose, after all the money furnished by the city and State, and such as may be obtained on the proposed loan is spent, and still a large sum should be wanting to complete the road, how is this to be raised? Not by *private* subscription by any means. Individuals are not going to put their means into a road only to benefit a State, or a large city, But the State and city may change their policy, and refuse to increase their aid. In such case the work may be brought to a dead stand,

We think the above company have gone to work exactly the wrong way, the credits of the city of N. O. and the State of Lousiana, should have been kept as a resource for *final* resort, upon the failure of all other sources of supply. In fact these credits should never have been resorted to at all. There was no necessity for such a step. There is an abundant amount of capital both in the city and upon the line of the proposed road, for its construction, which could have been made available for this object had the proper policy been pursued: The Mobile and Ohio Railroad Company find no difficulty in constructing their great work without State aid certainly with the greater capital of New Orleans, the New Orleans, Jackson and Great Northern company could have accomplished as much. If the citizens of New Orleans have not the enterprise to furnish a sufficient amount of means to secure the construction of the above road they will certainly lack the capacity for its proper management. The time has not yet come for this work, and they will do well to postpone it till they find themselves inpossession of *all* the conditions of success.

Again, we think they mistake in sending their securities at this early day to England for sale. To be sure, they could not be sold in this, nor in any *domestic* market, which is conclusive proof that they are not well based. There is a very large amount of foreign capital sent over here for investment, now lying idle for the want of suitable securities to meet the requirement of purchasers. Our capitalists are certainly sufficiently lax in their notions as to what constitutes a good security, and when one is offered that does not come up to their standard, it ought not to be negotiated. If those offering cannot bring them up to it, they should withdraw them till they can. This running off to England with what cannot be sold in our own market, may in the end be productive of the worst results.

Bonds of R. R. that cannot be sold at home, shoul not be sold at all. For good securities there has never been a time for two years when there has not been a regular and steady demand, and the markets at the present instant would take a much larger amount than is now offering. There is a plenty of money for our legitimate projects, and it is much better both for purchaser and seller, that our loans should be brought out here, than sent abroad. If they will not sell here, they are not safe to be taken by the foreign purchasers, who should trust to the wider and better means of information, and the keener instinct of our own people, than to the representation of interested parties

There is no road that we should prefer seeing built to the New Orleans, Jackson and Great Northern. We think it calculated to be of eminent service to the city of New Orleans. To secure the results predicated of it, and to make it productive of the greatest good to all parties, we desire to see the adoption of a wise policy both in its construction and management. We do not think the policy pursued thus far has been such a one. We think the present proposed sale of the company's bonds would be an injury instead of an advantage, to the project. There is a work to be done before selling the bonds, which cannot be done after.—The golden opportunity of placing the scheme upon a proper foundation will be lost. The bonds offered do not rest upon a proper basis to render them secure beyond a contingency. They could not be sold, neither in New Orleans nor in this market. If they are sold in the London market, it is only because greater ignorance prevails there as to their value. If Mr. Robb would render this company a real service and one within his power, he will come home, raise an individual stock subscription of $3,000,000 or 4,000,000, collect and expend it in construction, and then he will be in shape to borrow money, not in the English market, but in our own, where his loan should have been brought out, and would have been had it possessed sufficient merit to command the attention and confidence of our people.

Ross and Rutter's Patent Railroad Track Sprinkler and Dust Layer.

This is an efficient and simple machine for laying the dust on railroads. It moistens the air surrounding the cars, reduces the friction between the wheels and rails, prevents the bearings from heating and wearing, and protects the paint and varnish of the cars, so as to save much labor in cleaning. Every experienced railroad man is aware that a train of cars is moved with less power on a *wet* than a *dry* rail.

The valve condncting the water to the track may be so attached to the throttle valve lever of the engine, as to open and close with it, thus letting on the water at starting, and giving a dry rail to stop on. The discharging apparatus can be connected with the tender, if the latter be of sufficient size.

The nuisance of dust is almost intolerable to passengers during the summer months, and in no way can it be so effectually checked as by the use of this track sprinkler.

The dust is laid so effectually with this machine as to give no annoyance whatever to passengers. It is in fact an indispensable article upon every railroad, and where one is used the passengers will not submit to its being taken from the train.

Many testimonials of its comfort may be had from the patrons of the Boston and Providence, Providence and Stonington, and other railroads where it has been satisfactorily used.

A committee of the New England Association of railroad superintendents, Messrs. Wm. Raymond Lee, Wm. A. Crocker, and Isaac Hinkley, reported upon this improvement, under date of July 12, 1848, as follows:

"Your committee are fully convinced of the utility of track-sprinklers connected with R. R. trains; their use promotes the comfort of passengers, keeps the cars clean, and the bearings more free from dust."

Further information may be procured by addressing Wm. E. Rutter, Elmira, N. Y.

Clark's Railway Machinery.

As we intend to present, from time to time, useful selections from this valuable work, we devote the present space to Mr. Clark's concluding remarks and recapitulation of his chapter upon the "behaviour of the steam during the exhaust." See Railway Machinery, page 118.

Concluding Remarks.—We have seen how much the mechancical efficiency of steam is opposed by atmospheric resistance, and impaired by clearance and back pressure. It is known, also, how severely steam suffers by condensation in the cylinder under certain circumstances. These are all impediments to the complete success of expansive gear. Another, but less obvious impediment is the adoption of a low standard of boiler-pressure; because the lower the head of pressure, the greater is the relative loss by the atmosphere, but principally because the expansive functions of the valve-gear are less available. On level railways this objection exists with greater force that even on railways with steep gradients, because, on the former, the pull is nearly uniform throughout, and therefore a constant high pressure in the boiler would be the more necessary for carrying out great expansion; whereas, on the latter class of lines, a lower boiler-pressure may suffice for purposes of great expansion, on descending gradients where but little steam is required. Moreover, the evil of low pressure is, as we have found in last chapter, greatly aggrivated by the resistance of the passages to the flow of steam from the boiler, at high speed, which reduces the available pressure in the cylinder precisely at the time it is most wanted. It is clear that, in general practice, cutting off at half stroke is reckoned good work for expansion; and very rarely indeed is the admission reduced below 30 per cent. of the stroke.—There is no sufficient reason why the ultimate expansion of steam enforced in certain classes of stationary engines, should not be more thoroughly followed out in the practice of locomotives, seeing that by the link motion a maximum suppression of 10 to 20 per cent. of the stroke is available. We have already shown that, in exposed cylinders, the economical use of expansion gear is limited by the formidable condensation that attends great expansion.

In all locomotive engines, it is essential to the entire success of expansive working that the cylinders be well protected and well-heated, that all the steam passages be wide and free, that the valve gear be maintained in first rate order, so that early suppressions may be effected, because the wear of the valve gear delays the movements ot the valve, and lengthens the admission especially towards mid gear; that by improved arrangements, the clearance at each end of the cylinder should be reduced to the lowest possible fraction; and that a high pressure in the boiler, of 100 pounds to one hundred and fifty pounds should be constantly maintained.

Recapitulation.—1. Work is an exertion of pressure through space, and the unit of work is the labor necessary to raise one pound through the height of one foot. Horse-power expresses the rate of work done, and one horse-power is equivalent to work done at the rate of 33.000 lbs. raised through one foot in 1 minute.

2. The effective mean pressure on the piston under the action of steam is equal to the mean positive and back pressures, as indicated on the diagram, and the area of the diagram is a measure of the work done during one stroke of the piston.

3. The horse-power of a locomotive, developed in the cylinder, is estimated from the diagram in terms of the speed, the diameter and stroke of piston, the diameter of driving wheel, and the effective mean pressure on the piston.

4. The resistance of the atmosphere on the piston is virtually constant under all conditions, being about 15 pounds per square inch. The greater the steam pressure, therefore, the less is that resistance in proportion; and hence, partly, the advantage in point of efficiency, of employing steam of higher pressure in the cylinder.

5. The superior efficiency of steam worked expansively, is due to the work done by the steam during the period of expansion, and up to the end of the steam stroke; and also to the reduction of back exhaust pressure by an earlier release.

6. If steam be admitted to the cylinder at the same pressure, the work done during expansion is actually increased as the period of admission is reduced, notwithstanding there is a smaller body of steam to be expanded; and during the exhaust till the end of the steam-stroke, the work done is sensibly *constant* for all admissions. Thus, the whole useful work done by the steam subsequently to the period of its admission is absolutely increased as the admission is reduced.

7. The loss of useful expansive force by a "premature" release of the steam worked expansively by a link-motion, is a mere trifle, practically nothing; and is much more than compensated by the prevention of back pressure.

8. The results from the "Great Britain," with well protected cylinders, port about 1-10th, orifice 1-16th to 1-11th, and inside lead about 1-12th of the area of piston,—having been found upon the whole superior to those derived from the other locomotives subjected to experiment, they are assumed, for present purposes, to be standard practical results of the action of steam in locomotives, worked by link-motion; and they form the basis of the following observations.

9. The loss of efficiency by back exhaust pressure varies as the square of the speed, and inversely as the square of the area of blast-orifice. At 60 miles, or 840 feet of piston, the loss in full gear amounts to from 1-3 to 1-10 of the whole power, when the orifice is enlarged within the practical limits of 1-16th to 1-11th of the piston; in the 5th notch, suppressing at 30 to 40 per cent., the loss at the same speed, and within the same limits of orifice, is from 1-8th to 1-50th of the whole power. At 30 miles, the loss is from 1-11th to 1-40th in full gear.

10. The resistance by compression rises very slowly with the speed; it increases also with the degree of expansion, from about 8 per cent in full gear to 28 per cent. in the 5th notch—by which, in the latter case, above ¼th of the power is neutralized by compression.

11. At the highest speeds the *whole* draw-back by brack pressure is nearly the same for all degrees of expansion, as what is reduced in exhaust pressure is made up by compression.

12. At the higher speeds of 30 to 60 miles, and with heavy loads, the greatest work done by engines generally, having ports about 1-14th, and blast-orifices 1-13th to 1-16th of the piston is effected with admissions not greater than 66 per cent.; showing that the greatest effective pressure is obtained with this admission.

13. In the "Great Britain," with the wider port and wider orifice, the greatest useful admission at the high speeds with heavy loads is at least 75 per cent. of the stroke.

14. The effective mean pressure in the cylinder varies with the period of admission. For an admission of three-fourths of the stroke, it is about 90 per cent. of the maximum pressure; for half stroke it is 67 per cent.; for one fourth stroke it is 40 per cent.

15. The consumption of water *as steam* under the same notch, per horse-power per hour, is practically constant for all the speeds observed.

16. The efficiency of steam worked expansively increases uniformly as the admission is shortened until for ten per cent. admission it is, just about double the efficiency of steam under ordinary full gear, or 75 per cent. admission. That is, the steam, when urged to the utmost degree of expansion by the link-motion, does about twice as much work per pound weight as when under full gear.

17. Accordingly, the steam consumed per horse power per hour, varies from about 30½ lbs. in the full gear to 16 lbs. with 10 per cent. admission. The consumption of coke, allowing 1 lb. for 8 lbs. of water, varies, in the same way, from 3·8 lbs. to 2 lbs. per horse-power per hour.

18. The clearance between the piston and the valve should be reduced to the smallest practicable amount, as the removal of clearance adds to the efficiency of the steam.

19. The preceding conclusions hold good, at speeds under 30 to 40 miles, or about 500 feet of piston per minute, for all cylinders, in good order, with ports at least 1-14th and (blast) orifice 1-12th to 1-15th of the piston, and having, if but partially protected 1-9th to 1-11th of inside lead. At the highest speeds, of 55 to 65 miles, for passenger engines, or about 800 feet of piston, engines of the above proportions consume by back pressure an excess of 33 to 12 per cent. of water above what is given by the rule, the excess being less as the admission is shortened.

In partially protected cylinders, additional allowance must be made for condensation, particularly when the maximum pressures are under 60 lbs. When the maximum pressures are 90 lbs. and upwards, and with above 60 per cent. admission, there is less condensation comparatively, and the exhaust is practically as good as in well protected cylinders. But, for highly expansive working, no pressure of steam, however great, can prevent the great evils of condensation.

20. Wiredrawing by the valve is really a partial "expansion," and is equivalent, in its action, to an earlier suppression than that with which the valve is ostensibly working.

21. In all locomotives, the thorough efficiency of steam by expansion can be developed only by well protecting and well heating the cylinders and steam-passages; by maintaining the valve gear in the best order; by reducing the clearance at each end of the cylinder to the lowest possible amount; and by the adoption of a sufficiently high pressure in the boiler.

Iron Manufacture in Great Britain.

THE METAL TRADES OF LIVERPOOL—IRON.

"There are at the present moment, 178 different ironworks in the kingdom, with an aggregate capital approaching £4,000,000. The production of pig-iron during the last twelve months was estimated at 2,697,240 tons; and, if we take only 2,000,000 tons, at £3 per ton, it makes the annual value of £6,000,000."—

The demand for iron of late years has greatly increased, owing to its adaptability for marine purposes, in the construction of ship-building and steamers, as well as in the formation of railroads; and, although there has been a great scarcity of coal generally in South Staffordshise and to some extent in Wales. The production of pig iron in the United Kingdom during the year 1852 was estimated as follows, the yield being calculated only upon those furnaces in blast:

	Furnaces. In.	Out.	Total.	Pigiron. Tons.
Scotland	113	31	144	775,000
South Wales	135	27	162	635,000
Ditto Anthracite	12	23	35	31,000
South Staffordshire	127	32	159	725,000
North Staffordshire	17	4	21	90,000
North Wales	6	7	13	30,000
Shropshire	27	13	40	120,000
Durham	18	8	26	110,000
Northumberland	7	6	13	35,000
Yorkshire and Derbyshire	35	7	42	150,000
Total	497	158	655	2,701,000

There is little doubt but in the course of 15 years, and even sooner, this manufacture will be doubled in its quantity. At the present moment there are 118 furnaces in blast in Scotland, producing at the rate of 800,000 tons per annum.

The principal stocks of pig iron held in this country are kept on wharfs and in yards at Glasgow, and on premises belonging to the iron works in the neighborhood, as Gartsherrie, Dundyvan, &c.; but there are smaller depots for pig iron, intended for consumption or re-manufacture in England, formed at Poulton, Fleetwood, Preston, Lancaster, Runcorn, Ellesmere Port, and Saltney, near Chester; therefore we should first ascertain the amount of such stocks, the shipments, &c., during the last seven years, which we find recorded in the report of Mr. John Barclay, iron broker, Glasgow, and Messrs. Stitt Brothers, Liverpool, as below:

Stocks of pig iron held in Scotland on the 31st. December in each year.

	Tons.
1846	145,000
1847	90,000
1848	100,000
1849	200,000
1850	275,000
1851	350,000
1852	450,000

Shipments of pig iron from Scotland.

	Foreign.	Coastwise	Total.
1846	tons 119,100	257,851	376,951
1847	" 143,460	227,005	370,465
1848	" 162,151	227,833	389,984
1849	" 153,183	221,943	375,126
1850	" 134,576	190,083	324,659
1851	" 192,676	260,080	452,756
1852	" 224,070	199,950	425,020

The consumption of pig iron in Glasgow and that neighborhood is now 4,000 tons a week; equal to 200,000 tons a year; and the manufacture of malleable iron in Scotland has been calculated as follows:

	Tons.
1846	45,000
1847	60,000
1848	90,000
1849	80,000
1850	80,000
1851	90,000
1852	90,000

As the United States of America purchase extensively, we will record the exports of pig iron thence, direct from Scotland, during the last seven years, to show the marvellous increase:

	Tons
1846	13,918
1847	44,993
1848	90,235
1849	94,212
1850	57,509
1851	80,019
1852	100,700

The entire exports of iron from Great Britain are now double what they were in 1825, having almost reached 1,500,000 tons in the past year, 1853, of which those of Liverpool exceed one fifth portion. The United States being our principal market, let us see what were the shipments of manufactured iron from Liverpool to the three chief ports, New York, Boston and Philadelphia, during the last seven years:

	Rails. Tons.	Bars, &c. Tons.	Hoops, &c. Tons.	Total. Tons.
1846	12,514	12,807	1,686	27,007
1847	12,635	37,543	7,195	57,373
1848	50,188	33,621	7,237	9 ,046
1849	33,849	57,135	13,203	104,187
1850	29,808	66,338	19,486	115,632
1851	78,199	64,301	19,293	161,793
1852	74,468	72,064	22,196	168,728

Of this extraordinary increase during the last year, 1852, New York received from us 135,299 tons; Boston, 24,414 tons; and Philadelphia, 12,-024 tons.

The shipments to the East Indies are falling off. The total exports from Great Britain to Calcutta of all sorts of iron last year only amounted to 14,-020 tons, of which 4,404 were sent from Liverpool.

The English Locomotive.

From that very interesting and instructive English work called "Our Iron Roads," we copy the following article:

"The history of the locomotive is full of interest, both in itself and in its results. Doubts were long entertained by scientific men as to the possibility of fully developing the powers of the engine, which greatly retarded its successful application. The conviction had firm hold upon the minds of those best informed upon the subject, that the adhesion of the wheels of a locomotive, technically termed *the bite*, would be insufficient for the maintenance of a heavy traffic; and that, though a light engine might be made to run even at a considerable speed, yet if heavy burdens had to be drawn the wheels would revolve without advancing.—Thus it is that

"Our doubts are traitors,
Which makes us lose the good we oft might win,
By fearing to attempt;"

for after much time, skill and money had been expended in devising various expedients to obviate the supposed evil, it was found to be quite imaginary, and that, for all practical purposes, no such difficulty as that apprehended would arise. To the connexion of the locomotive with the establishment of the Liverpool and Manchester railway, we have already referred. Despite the doubts of some and the denials of others, the locomotive was made capable of undertaking the great work of maintaining the interchange of people and of commodities; and as the demand upon its services increased, fresh energies were developed, till we behold it in the comparative perfection in which it now appears before us. But the improvement was gradual. Experience lent its aid to theory, and soon great alterations were found necessary in the form in which it first appeared.

It would be interesting to trace the several steps by which increased efficiency was given to the "steam horse," as this must be regarded as the most important element of success in the establishment of the railway system; but the briefest allusion must suffice. Though much more was performed by the early engines of the Liverpool and Manchester line than could have been anticipated, yet it was soon found that their strength was insufficient to sustain the shocks and strains to which they were exposed, and repeated and thorough repairs were indispensable. Thus the earliest railways must be regarded as schools for experiment in the construction of locomotives, as numberless projects had to be tried before the desired efficiency could be attained; and, as a natural result, there were engines of almost every diversity of shape and of power on the lines. For many years the locomotive departments of these early companies had to go through a course of elaborate and expensive improvement, to meet the requirements of a heavier traffic, and of higher velocities than it had entered into the imagination of the most sanguine friends of railways to anticipate. These trials, too, were not made with the calm deliberation which a salutary caution recommended, making good each step in the progress of discovery before advancing further, but amidst the bustle and responsibilities of every-day duties, that could scarcely be discharged within the period assigned. Engines, having known imperfections, but which it was impossible at the time to remedy, had to be employed, and repairs had to be made during the night, in order that the requisite number of engines might be prepared for the work of the coming day.

In this volume we cannot give other than a general account of these progressive improvements.—The outer and inner framings were stayed in various parts; iron wheels were substituted for wooden; crank axles were formed with almost double the amount of metal at first employed; and pistons, piston rods, connecting rods and brasses were strengthened; till, with the exception of the boiler and cylinders, there was about as much left of some of the original engines as there was of the sailor's knife, which, while declared to be "quite an antique," was currently reported to have recently had a new handle and several new blades! Alterations so extensive naturally involved a considerable augmentation of the weight of the engine; and thus, from the four tons and a half which the "Rocket" weighed, it before long increased to ten tons of the "Planet" class.

Other important alterations followed. The cylinders and the machinery by which the working wheels were driven, were originally placed outside the wheels, but they were soon removed to the space between the wheels under the boiler. This was regarded as a great improvement, inasmuch as the cylinders were enclosed in the smoke-box, and protected from cold, and the driving power was made to act nearer the center of *inertia* of the engine and load. There was, however, a serious draw-back; for it required that the axle of the driving wheels, on which the greater part of the weight of the engine rested, should be constructed with two cranks, so as in fact to be broken and discontinuous in two places. This was admitted to be an anomaly in engineering; but it was allowed on account of the countervailing advantages

attending the arrangement. More recently, it was found almost impracticable to compress machinery of sufficient power into the narrow space between the wheels; and the cylinders and working gear have, in some cases, been restored to their original position outside the wheels. This however, has been objected to, as giving instability to the engine when in motion; and in many cases a return has been made to the former arrangement of the machinery.

Improvement has thus advanced in the structure of the engine; and though it cannot be said yet to have attained perfection, still the contrast which is presented between the locomotive as it was in its earlier history, and as it is now, is as great as that between the poorest hack that ever tottered under a burden, and the race horse that won the last "Derby."

The £550 early engine, on four wheels and of five or six tons weight, is now snperseded by the six or eight wheel engine, of £2500, and of 20, 30, or 40 tons; and though cost and weight are not to be identified with efficiency, yet they are fairly indicative of the extent of the alterations, and, we may say, improvements which have been made. The successful competitor on the Liverpool and Manchester line was required to draw a load of only three times its own weight, or a total of less than twenty tons; an engine will now drag after it, without difficulty, thirty passenger carriages, each weighing five tons and a half, at thirty miles an hour; while the express train on the Great Western proceeds, when in motion, at from sixty-five to seventy-five miles an hour; and the goods engines are capable of propelling five hundred tons at twenty miles an hour.

The power of the engines now ordinarily employed on our railways is indeed enormous. On the broad gauge we may take the "Lord of the Isles," which was shown at the great Exhibition, as the type of the class of locomotives constructed on the Great Western line since 1847; it is capable of taking a passenger train of one hundred and twenty tons, at an average speed of sixty miles an hour, upon easy gradients. The evaporation of the boiler, when at full work, is equal to 1,000 horse power, of 33,000 lbs. per horse; the effective power, as measured by a dynamometer, is equal to 743 horse power. The weight of the engine in working order is thirty-five tons, besides the tender, which, when laden weighs nearly 18 tons.—The diameter of cylinder is eighteen inches, the length of stroke 24 inches, the diameter of the driving wheel 8 feet, and the maxmium pressure of steam 120 lbs. The actual consumption of fuel in practice, with an average load of twenty tons, and an average speed of twenty-nine miles, including stoppages, is rather more than 20 lbs. of coke per mile. For the better distribution of the enormous weight of the "Lord of the Isles," it runs on eight wheels. The cylinders are laid horizontally under the front of the boiler, and can be easily examined together with the rest of the working parts, by going down into the ash-pit, over which the engines are often made to stand in the sheds.

Nor is the narrow gauge behind in the colossall power of its engines. One of the strongest of these is the "Liverpool," built on Crampton's patent which was also exhibited in the Crystal Palace. This engine contains 2285 feet of heating surface, being 270 feet more than the largest engine on the broad gauge. The diameter of the cylinder is 18 inches, the length of stroke 24, and the diameter of the driving wheel 8 feet. The engine itself weighs thirty tons, and the evaporation of the tubes, when in full work, is equal to 1140 horse-power. The pressure of the steam is 120 lbs., on the square inch. The engine is built with a very low boiler, and the greatest weight is on the extreme wheels in order to insure steadiness. To realize the amounts thus given of the power and the speed is not easy, and in order to understand them more fully, one or two illustrative facts may be mentioned. When a speed of seventy miles an hour is obtained, a space has to be passed over of 105 feet per second, that is to say 35 yards must be traversed between the tickings of the clock. If two trains proceeding at this speed pass one another, the relative velocity will be doubled, so that if one of them be seventy yards long, it would flash past the other in a single second of time. Now, according to the experiments of Dr. Hutton, it appears that the flight of a cannon ball having a range of 6700 feet is a quarter of a minute, which is at the rate of five miles a minute, or 300 miles an hour; and hence it follows that a railway train moving at 75 miles an hour, has one-fourth of the velocity of a cannon ball,

In order to understand the processes by which one of these steam monsters is put together, a visit should be made to a locomotive factory; but as this may be difficult, the proceeding adopted in their construction may here be briefly sketched by a description of the establishment of the Great Western railway at Swindon.—

The factory here consists of two large squares, surrounded by workshops, with one or two smaller squares adjoining. In connexion with these is an engine-house, where spare locomotives are kept and a building resembling a veterinary college, where defects are remedied.

The smithy may be first noticed.—This is a long range of buildings, containing 176 forges, with all the "appliances and means to boot" for their effective working. Here all the parts of a locomotive which are of wrought iron,—as axles, piston rods, connecting rods, and other pieces too numerous to mention—are produced. Three furnaces are provided in this department, in one of which the scraps of iron which come from the lathes and fitting shops are melted. Near the furnaces are two of Nasmyth's steam-hammers, which are as potent in their work as they are easy to be directed. Before these hammers were introduced the forging of huge masses of metal was both a tedious and a doubtful process; now the requisite power can be obtained to insure security in the work. Yet this mighty engine may be directed by a boy, and is so fully under command that it can be made to crack a nut without injuring the kernel, or to drive a tin tack into a piece of wood by successive raps. One of the most important parts of the work which the steam hammers have to perform, is the forging of the crank axles of locomotives, and by its aid the huge masses of metal are welded and moulded without difficulty.

The wheel-working is a process of interest, and on the necessity of good workmanship here, it would be superfluous to dilate. The whole of the wheels are formed of wrought iron, the several parts being forged in pieces and then welded together. In the large eight feet driving wheels, there are twenty-four spokes. A wheel consists altogether of more than a hundred pieces. The scenes which are presented in the various operations around the forges, are characterized by a wild magnificence, which must be witnessed to be appreciated.

The next part of the establishment is the boiler house. The materials of which the boiler is chiefly made consist of sheet iron, prepared for the purpose, the plates of which, when brought to their proper size and shape, are drilled round the edges so that they may be firmly held together by means of rivets. The noise which fills the building is most deafening. To speak so as to be heard is impossible, and if it be attempted, the motion of the lips of the speaker is the only evidence that he is talking. The impression produced upon the minds of almost all who enter a boiler house for the first time is, that the workmen commence a most tremendous clattering of hammers and plates for his special annoyance, as it seems almost impossible that any useful undertaking can be progressing as the result of such a din.

In the foundry which may next be visited, the cast iron works are carried on, and a variety of operations may be witnessed, while in an adjoining building the wood-work of the buffers and the models in wood for the castings are prepared.

The fitting-shops form one of the most interesting departments of the establishment. In order to supply the power necessary to put in motion the numerous machines in the factory, there are two powerful engines: one with twenty-one-inch cylinders, and another with thirty-inch-cylinders. In the lower turning-shops, the axles, crank-axles and other large parts of locomotives are finished. Here is a slotting machine, which is so complete in its operation, that all the manual attention it requires is to have the supply of soft- soap and water kept up to preserve the tool from becoming unduly heated. The value of the great machines employed in this establishment may be gathered from the fact, that the resources of manual labor would be quite insufficient to secure the accuracy of adjustment, and security of workmanship, which are essential. And when the recent demands of advancing mechanical science arose, the necessity for more powerful means became imperative; and a sudden call for machinery of superior accuracy was made. The steam-engine itself, which supplies us with such unbounded power, owes its present perfection to the admirable means thus obtained, of giving to metallic objects the most precise and perfect geometrical forms; and it is this alone which has provided the means of carrying into practice the accumulated results of scientific investigation in mechanical subjects.

The last department is the erecting-shed, in which all the parts of a locomotive numbering no fewer than 5416, are put together; and it will be readily conceived that nothing short of the utmost completeness and accuracy, in the finish of these parts, could enable the workmen to combine them in one harmonious and efficient unity. Yet the failure of one screw or bolt, or the bending of one rod, may hereafter involve, not only the costly fabric itself in ruin, but occasion the destruction of property and life to a terrible extent. So complete must be the details, so accurate the adjustment, that Mr. Robert Stephenson well remarked that a locomotive "must be put together

a carefully as a watch." The average cost of an engine on the narrow gauge having a cylinder of 16 inches in diameter is rather more than £2000; and of an 18 inch, £2500; while on the Great Western the larger class cost no less than £3000 each.

Traction and Adhesion.

It is sometimes stated that the power of a locomotive "is limited by its adhesion," but as this rule does not have a practical application, it is well to distinguish between the two expressions of locomotive power. Traction is the expression of the power of the locomotive which is derived from the pressure of the steam in its cylinders; that is, a dynamical measure of the revolving power of the drivers, applied at their peripheries. Adhesion on the contrary does not contribute one ounce to turning the drivers, but renders the traction avilable by its prevention of slipping and the consequent result of advancing the engine on the rails. Without traction, the whole engine with all its parts would stand still; with traction but without adhesion the machinery of the engine would operate, but without advancing the engine. The fact of the surplus of adhesion, with engines of ordinary proportions, is established in the prevalent use of the truck frame, and the trailing wheels. The English passenger engine employs but one-third of its adhesive weight. The American passenger engine employs two-thirds of its adhesive weight.

Traction, at the same steam pressure and same piston stroke, is increased directly with the square of the diameter of cylinder, and inversely as the diameter of driving wheels. Many of the Philadelphia and Baltimore built engines, have been fitted with small drivers, to adapt them for running slow and with large cylinders to admit of economical expansive working. Nineteen and twenty inches have become common diameters of cylinder, with 22 inch stroke, and 3 feet 7 inch wheels. These engines were designed to be worked to their full capacity, as they are with the heavy trains upon the Reading road, and with both heavy trains and heavy grades upon the Balt. & Ohio road. To use a high pressure of steam in these large cylinders, destroy the proportion of adhesion to traction, would making the latter in excess. Yet it has been found practicable with the system of working pursued upon these roads, to dispense with a large part of the adhesive weight of their engines, by retaining the truck frame under the forward ends. This has been done repeatedly with the heaviest engines, and where also the surfaces of the tires have been of chilled cast iron. This fact exhibits in a strong light the sufficiency of the amount of adhesion furnished by the chilled tire.

But where engines of this class which were designed for a special service, have been used over ovel roads, and where the engineers, to make time, would increase the steam pressure, it is found that the traction of these engines is in excess. On the Pennsylvania Central road, with engines having large cylinders, small wheels and a truck frame, the endeavors of the engineer to make pressure compensate for a small driving wheel, have resulted in a trouble with slipping the drivers. This, for want of any other excuse, has been attributed to the chilled wheel, with which Baldwin's engines were furnished. But any one conversant with engines or capable of estimating and comparing pressures, would perceive that the working of heso engines could not harmonize with efficiency of their proportions, and that the best thing which could be done would be to reduce the steam pressure, or which is more certain and satisfactory to the enginemen, to increase the diameter of the drivers. The noble stock engines building by the Baltimore and Ohio railroad are models for freight engines for any road. Cylinders, 19 by 22 inches, 6 drivers of 50 inches diameter, and four trucks. Here we have the chilled cast iron tire in successful use under an adhesive weight of 7500 pounds to each tire.

There is no possible doubt after learning the experience of the great roads of Pennsylvania and Maryland, that the ten wheel engine is the great standard for a freight business. It secures, first, ample adhesion with chilled or with wrought tires, Second, a more favorable distribution of weight than any other; being both easy and steady upon the track. It admits also of reducing the jolting points of the engine by the use of the centre bearing for the truck. It allows of horizontal cylinders with a connection close to the side of the wheel.

By the happy concurrence of physical facts, of which we have heretofore spoken, the necessary machinery for any amount of traction involves, by its own weight, the necessary and corresponding adhesion, and so whenever an engine is worked to an unusual or disproportioned pressure, its traction may be said to be *exceptional*, which must be met by an exceptional adhesion, consisting of a constant and destructive use of the sand-box.

Illinois.

Peoria and Bureau Valley Railroad.—We learn from the Peoria Republican of the 27th ult., that a meeting of the stockholders in the above road was held in that city on Monday last, at which time the following board of directors were elected:—

T. D. Brewster, B. Lombard, John Frink, G. C. Bestor, J. L. Griswold, I. Underhill, and W. S. Moss.

A resolution to the effect that the route should be located as near as practicable to the towns of Henry and Chillicothe, and not more than half a mile distant from either was adopted.

After the adjournment of the stockholders meeting, the directors elect met and organized. The following officers were chosen:

President.....Isaac Underhill.
Vice president.....J. L. Griswold.
Secretary.....Washington Cockle.
Treasurer.....N. B. Curtiss.

We learn that a contract for the construction of the above road, has been completed with Farnham, Sheffield & Co.

Chicago and Mississippi Railroad.—The extension from this city to Bloomington—says the *Springfield Register*—is being prosecuted with great vigor. On Monday the Sangamon bridge was so far completed as to admit the passage of freighted trains, and we learn that the bridge across Fancy creek is nearly finished. From half to three quarters of a mile of track are laid down daily, and it is supposed that some fifteen miles will be in running order by the fourth of July.

There is no road in the country which is more vigorously and efficiently prosecuted. It is in safe hands, and while Messrs. Lee, Lathrop and Hickox are concerned in its management, there is an ample guaranty that its affairs will be judiciously conducted.

Lexington and Big Sandy Railroad.

We have the first annual report of the president and directors to the stockholders of this company, from which we gather the following information relative to its condition and prospects. The report is dated May 25, 1853, or less than one year after the organization of the company. During this time the following counties and the city of Lexington have subscribed to the stock of this company as follows:

Fayette county	$150,000
Clarke "	200,000
Montgomery do	200,000
Bath do	150,000
Carter do	75,000
Lexington city	150,000
	$925,000

There are assurances of an additional subscription of $75,000 from Greenup county. The individual subscription amounts to near $200,000.

The location of the road has been fixed as follows: Lexington to Ohio river through Winchester, Mount Sterling, Owingsville, McIntires' Ferry, Triplett Valley, Tygert Valley, Little Sinking, Barretts' Creek, Williams' Creek, Chadwick's Creek, and Big Sandy. Length 125 miles; maximum grade, forty-five feet per mile, and the estimated cost of preparing road bed ready for superstructure, $13,000 per mile.

The position of the Lexington and Big Sandy railroad within the great current of travel through Kentucky may be comprehended when it is known to be one most important link in the great east and west thoroughfare, south of the Ohio river.

At Lexington a connection will be had through the whole west and southwest, through Louisville, and through Danville and Harrodsburg. The travel leaving the Mississippi river at Memphis, over the proposed line from that city to Bowling Green, Kentucky, will pass to the Atlantic seaboard over this line. From Memphis a road is proposed to be made to Little Rock in Arkansas, and thence south west to the interior of Texas, thereby to open a communication between the great south west and the Atlantic seaboard in the route of the Lexington and Big Sandy line.

At the mouth of Big Sandy the road will connect with the Virginia Central road to Richmond, Norfolk and Alexandria, and from the latter place to Baltimore and the Northern cities. This road lies also in the channel of much of the summer travel to the mineral springs of Virginia and Kentucky, a travel estimated at 100,000 annually.

The road passes through seven counties, whose total property valuation for 1852 was $42,789,020, and whose yearly production as long ago as 1850 was full 90,000 head of cattle, 125,000 sheep, 200,000 swine, 32,000 horses, and 10,000 mules, which, with the products of the soil, must have been of a value of $7,000,000.

Carter and Greenup counties are engaged in the manufacture of iron, and need only the means of access to market to increase their productions five fold. The have already thirteen blast furnaces.

Iron is also reached in Bath county, sixty miles from Lexington, and from hence to Big Sandy the route lies through inexhaustible beds of iron and coal; and contiguous to quarries of sand stone on Triplett creek, limestone on Tygert's creek, clear white sand, such as is used for the manufacture

of the most costly glass, and lumber of the finest quality.

It is estimated from the most reliable authority that the export tonnage of domestic productions from the counties on this line will amount to $225-000 yearly; the import tonnage to $112,500, and the amount of tonnage from counties off of the main line to $112,500, or a total freight business of $45,000 yearly. Adding 151,125 way passengers at $1.25 each, as the number estimated from the business of the Baltimore and Ohio and Penn. Central roads, and 100,000 through passengers, at $3, and allowing $8,000 from mails and expresses, the total earnings will be $846,906 yearly, of which one-half may be anticipated as clear profits, equal to $473,435.

In conclusion, the report bestows some consideration upon the prospective connections with this road.

The New Orleans, Jackson and Gaeat Northern railroad will necessarily connect with the great east and west central line, thus affording facility for travel and transport to and from New Orleans through the center of Mississippi.

The railroad from New Albany, opposite Louisville, crosses the Ohio and Mississippi railroad, and will thereby connect Louisville with St. Louis. and the Lexington and Big Sandy road will form one great link in this great "Central railway of the Union."

Knoxville and Charleston Railroad.

This company has been organized by the choice of the following gentlemen as directors.

Blount. Co. Wm. Wallace, Asa Watson, R. I. Wilson, J. E. Toole, James Porter, Sam'l Pride, Alex. Kennedy.

Knox. Co. C. H. Coffin, J. A. Mabry, J. G. M. Ramsey, C. Wallace, C. M. McGhee, Jas. C. Moses, D. H. Cummings, Wm. G. Swan.

Wm. G. Swain, Esq., was elected Prssiden of the company, Charles H. Coffin, Esq., Secretary, and Dr. Sam'l Pride, Treasurer.

Improved Railroad Car Seat.

John T. Hammit, of Philadelphia, has invented a car seat, so constructed that the person seated in it may, at pleasure, and without the slightest inconvenience, regulate its position either for sitting upright or reclining in it. The particular improvement that has been patented in this instance is the power of operating the leg-rest from the motion of the seat and back, by means of a lever and rod. The leg-rest is hinged to the front edge of the seat, and connected by a link to a lever, the fulcrum of which is joined to the under side of the seat, and the lever operated by the standing frame of the chair. By moving the person backward or forward, the chair may be reclined or brought up, and by means of a simply arranged latch, can be readily locked or fastened, so as to remain in the position desired.

As designed for use in railroad cars, two of these chairs are placed side by side, but are yet kept so essentially independent of each other that either of two passengers, sitting in adjoining seats may choose his position without in the least interfering with his neighbor. This is an important advantage, as one may be disposed to sleep or lie at length, when another may prefer to keep awake or sit up. The chairs are capable of being fitted in a car at the short distance of four feet apart, on a direct line running the length of the car, and when extended horizontally, will lie at an angle of about 45 degrees. Each seat declines slightly from the front edge, so as to prevent one from slipping off with the jolting motion of the trains, and the back is furnished with a sliding head-rest, which may be adjusted to suit the convenience of the occupant.

Myer's Coal car.

Our friend, Mr. C. Tiers Myers, is at Cumberland, Md. on his way to George's Creek Valley, where he intends to apply the Patent Cylinder Coal car to the transportation of the Bituminous coal from the Parker Vein, Frostburg and other mines. The principle of the car has commended itself to all those engaged or interested in the transportation of coal in that section, who predict for it an entire success. We shall be prepared in a few days to lay before our readers the results of experiments made with a view of testing the efficiency and economy of this car, and in the mean time would invite the attention of persons in the coal trade to the merits of the car as exhibited in its construction and in its already successful application, in trains upon the Reading, Philadelphia, and Baltimore, and other roads.

Bellefontaine & Indiana Railroad.

This important work has within the past week been added to our list of "Railroads in operation." Independent of the completion of a road 120 miles in length, the event has an additional importance for the relation that this work bears to other lines, and to the trade and travel of the great State of Indiana. In connection with other roads, it forms a direct and continuous line of railroad from Terre Haute, upon the western boundary of this State, to Cleveland, a distance of 354 miles, and in the convenient route for the business and travel of the State. This line is made up of the following links, viz:—

Cleveland and Columbus to Galion	79
Bellefontaine & Indiana	118
Indianapolis & Bellefontaine	84
Indianapolis and Terre Haute	73
	354

All these roads have similar interests, and are, in fact, but parts of *one* line. They are so regarded by their owners, and there is unmistakeable evidence that all will be speedily consolidated into *one* road. Such an event could not fail to increase the business and value of all, in the same manner as the consolidation of the roads between Albany and Buffalo has rendered that great line vastly more efficient and valuable. It is also proposed to embrace in the above line the road now in progress from Terre Haute to St. Louis. It will be seen, by reference to a map, that the last named road is but the complement of a great line extending from Cleveland to St. Louis. The obstacles to the construction of this road now appear to be entirely removed, and we know it to be the intention of parties having it in charge to push forward the work of construction with all possible vigor. Mr. Brough, the President of this road, has also just been elected President of the Indianapolis and Bellefontaine road, and will very likely occupy the same relation to the other companies that comprise this great line, as fast as their annual elections for change of officers shall come round.

The flattering business prospects of this road, together with the proposed consolidation, has had a most favorable effect upon the stock, which is in a demand at $110, with very little to be had at that price. The parties who have labored so very long and faithfully to secure the construction of this work, find at this early day their labors crowned with an abundant success.

Portland and Montreal Railroad.

The laying of the iron upon this great work was completed last week, and on Monday next, the regular passenger and freight trains will commence running from the Atlantic to the river St. Lawrence, a distance of 290 miles.

The completion of this great work will be celebrated at some future day by appropriate ceremonies. During the season of pleasnre travel, the road will be devoted strictly to business. For this travel it cannot fail to become the leading route in this country. It possesses unsurpassed attractions, both at either terminus and upon its line, traversing as it does for nearly 100 miles the loftiest and most extensive mountain range in the eastern States. The road has every prospect of a lucrative business before it, and its success will be a good harbinger of that of the Grand Trunk line, of which it is to form an important part.

The completion of this road is one of the leading events in the railway history of the country. It is one of the few great lines projected with a view of reaching and commanding the trade of the interior. It connects the great basin of the St. Lawrence with tide water, by the shortest route practicable for a railroad, and opens a direct and easy outlet for the agricultural products of the west to the commercial and manufacturing districts of New England. Between those extremes of the country, widely separated but having the most intimate business relations, the above road must become one of the leading avenues of trade and travel. Its importance will be much increased by the construction of the Grand Trunk line, which will carry forward its track with an uniform grade to Lake Huron, on one hand, and Quebec on the other.

But we do not now intend to give a long account of this work, only to note the fact of its opening. A more detailed description will be reserved for a future occasion.

Stock and Money Market.

The aspect of Wall street for the past, has been very much like that of the preceding week. Money has been sufficiently plenty, with but little doing in stocks. For a day or two past, however, there has been greater activity, with a slight advance in some of the *fancies*. Erie has improved the most having recovered to 79⅛ from 76¾, its lowest point of depression on Monday last. The *future* of this stock is of course entirely uncertain. Its *value* can only be demonstrated by *time*. Its market price will depend upon the position of parties operating it. We think the changes that are taking place in its management will prove a decided benefit to the road. Under the old management, the company have found themselves unable to pay a dividend. There must be some cause for this. It may have been from incompetent management. If so a change may enable the company to resume its dividends. We are satisfied that the present treasurer has an *unanimous* consent to go. He has probably wisely anticipated the action of the directors. He has enjoyed the reputation of being

the leading speculator in the stock and securities of the company, and now that a heavy loss has been sustained by the public, it is seen that the position of treasurer gives him an unfair advantage in the arena of speculation, which the public are no longer disposed to tolerate. So long as everybody thought themselves making money, acts of officials were overlooked, which are now regarded as high misdemeanors. The disasters which have befallen the Erie road, will undoubtedly have the advantage of creating a higher standard of official service. We do not believe that, hereafter, public sentiment will tolerate speculation in the stock and securities of a company by a person who is a leading officer in its management.

We happen to know something about the internal management of the Erie railroad, the manner in which its accounts have been kept, and the mode of making up returns to the legislature, and we are as satisfied that the accounts and returns have been made up more with reference to certain objects to be effected for the benefit of interested parties, than to the real facts of the case; a result that might have been expected from the relations sustained to the company by such parties. However, a healthy process of reform is going on, which strikes at the very root of the evil by removing those who have been the authors of it.

The Panama railroad company have declared a dividend of 5 per cent from the earnings of the past 6 months, and what is better, have accompanied it with a balance sheet, showing the financial condition of the company, which is stated to be as follows:

Gross earnings six months		$235,617
Surplus in January		24,987
Total		$260,604
Paid for Land Transportation, Mails, etc.	$34,260	
Running expenses	55,200	89,460
Nett earnings		$171,144
The stock issued is	$2,194,062	
Bonds not converted.	808,000	
Total present Capital.	$3,002,062	

It will be recollected that the company in January last claimed to pay a dividend of 10 per cent. from the previous 6 months earnings, which, unaccompanied with any exhibit whatever, called forth some severe censures from us upon the impropriety of such a course. We are glad to see that our strictures have had the desired effect. No company can presume to declare a dividend without a balance sheet. All that we claimed of this company was that they should show their hands. Having done so, we are satisfied, however much we may disagree with the results to which they arrive.

The directors also report that the road is finished and in operation from the Atlantic to the crossing of the Chagres river at Barbacoas, a distance of 28 miles; and about 8 miles more will be in operation as soon as the superstructure of the bridge can be placed across the Chagres river on the stone piers which are now completed.

The Pacific railroad loan has been withdrawn. The security was a good one, but injudiciously, we think, brought before the market. The company should have commenced selling in small quantities, till the public were made acquainted with the security, the resources upon which it was

Railway Share List,

Compiled from the latest returns—corrected every Wednesday—on a par valuation of $100.

NAME OF COMPANY.		Miles open.	Capital paid in.	Funded debt.	Tot. cost of road and equipm't.	Gross Earnings in 1852.	Net Earnings in 1852.	Dividend, 1852.	Price of Shares.
Atlantic and St. Lawrence	Maine.	150	1,417,587	3,000,000	4,649,392	200,233	.....	none	95
Androscoggin and Kennebec	"	55	809,378	905,300	1,994,429	131,006	.....	none	30
Kennebec and Portland	"	72	876,141	800,000	2,180,000	133,338	.....	none	40
Port., Saco and Portsmouth	"	51	1,355,500	123,884	1,459,384	208,669	.....	6	99¾
York and Cumberland	"	20	227,981	291,200	In progres	15,694	.....	none	40
Boston, Concord and Montreal	N. H.	93	1,649,270	622,000	2,540,217	150,538	79,659	none	41½
Concord	"	35	1,485,000	none.	1,485,000	305,805	141,836	10	109
Cheshire	"	54	2,078,625	720,900	3,002,094	287,768	55,266	5	....
Northern	"	82	3,016,634	.....	.....	328,782	163,075	5	57¾
Manchester and Lawrence	"	24	717,543	.....	.....	.....	.....	6½	99
Nashua and Lowell	"	15	600,000	none.	651,214	132,545	51,513	8	109
Portsmouth and Concord	"	47	.....	.....	1,400,000	.....	.....	none	....
Sullivan	"	26	.....	.....	673,500	.....	.....	none	9
Connecticut and Passumpsic	Vt.	61	1,097,600	550,000	1,745,516	.....	.....	none	45
Rutland	"	120	2,435,328	1,964,588	.....	324,790	165,340	none	32½
Vermont Central	"	117	8,500,000	3,500,000	12,000,000	.....	.....	....	18¼
Vermont and Canada	"	47	1,500,000	.....	1,500,000	Leased to	the Vt. C	ent.	101¾
Western Vermont	"	51	392,000	700,000	.....	Recently	opened.	none	....
Vermont Valley	"	24	.....	.....	.....	.....	.....	none	....
Boston and Lowell	Mass.	28	1,830,000	.....	1,995,249	388,108	130,881	7½	97¾
Boston and Maine	"	83	4,076,974	150,000	4,092,927	659,001	338,215	7	104½
Boston and Providence	"	53	3,160,390	390,000	3,546,214	429,484	212,625	6	86½
Boston and Worcester	"	69	4,500,000	425,000	4,845,967	758,819	331,296	7	101¼
Cape Cod branch	"	28	421,295	171,800	633,906	60,743	30,056	2½	40
Connecticut River	"	52	1,591,100	193,500	1,801,946	229,004	72,028	5	57
Eastern	"	75	2,850,000	500,000	3,120,391	488,793	241,017	7½	93½
Fall River	"	42	1,050,000	none.	1,050,000	229,445	99,589	8	104
Fitchburg	"	66	3,540,000	100,000	3,633,673	574,574	232,787	6	99½
New Bedford and Taunton	"	20	500,000	none.	520,475	164,230	43,950	7½	117
Norfolk County	"	26	547,015	819,743	1,245,927	67,251	23,415	none	63
Old Colony	"	45	1,964,070	282,300	2,293,534	322,213	101,510	none	87½
Taunton Branch	"	12	250,000	none.	307,136	137,406	24,399	8	....
Vermont and Massachusetts	"	77	2,140,536	1,001,500	3,203,333	218,679	18,648	none	17½
Worcester and Nashua	"	45	1,134,000	171,210	1,321,945	162,109	66,900	4½	59
Western	"	155	5,150,000	5,319,520	9,953,759	1,339,873	682,195	6½	98¾
Stonington	R. I.	50	.....	.....	.....	.....	.....	....	50½
Providence and Worcester	"	40	1,457,500	300,000	1,731,498	253,690	139,514	6	....
Canal	Conn.	45	.....	.....	.....	.....	.....	10	....
Hartford and New Haven	"	62	3,000,000	472,000	.....	600,408	332,223	none	124
Housatonic	"	110	.....	.....	2,500,000	329,041	168,902	none	....
Hartford, Prov. and Fishkill	"	50	.....	.....	In progres	.....	.....	none	....
New London, Wil. and Palmer	"	66	558,861	800,000	1,511,111	114,410	.....	....	....
New York and New Haven	"	61	2,992,450	1,641,000	4,825,937	814,714	443,993	7	108
Naugatuck	"	62	926,000	440,000	.....	.....	.....	....	....
New London and New Haven.	"	55	750,500	650,000	1,380,610	Recently	opened.	none	45
Norwich and Worcester	"	54	2,121,110	701,600	2,596,488	267,561	116,965	4½	54¾
Albany and Schenectady	N. Y.	17	1,000,000	685,301	1,774,584	296,112	164,448	8	135
Buffalo and New York City	"	91	900,000	1,550,000	2,550,500	Recently	opened.	none	85
Buffalo, Corning and N. York.	"	132	.....	.....	In progres	.....	.....	none	65
Buffalo and Rochester	"	76	1,825,000	184,903	2,415,014	619,976	415,323	10	182
Buffalo and State Line	"	69	879,636	872,000	1,921,270	Recently	opened.	....	130
Canandaigua and Niagara F	"	50	.....	.....	In progres	.....	.....	....	....
Canandaigua and Elmira	"	47	425,509	582,400	987,627	76,760	39,360	none	68
Cayuga and Susquehanna	"	35	687,000	400,000	1,070,786	74,241	23,496	none	....
Erie, (New York and Erie)	"	464	9,612,995	24,003,865	31,301,806	3,537,766	1,691,623	7	79¼
Hudson River	"	144	3,740,515	7,046,395	10,527,654	1,063,659	338,783	none	73¼
Harlem	"	130	4,725,250	977,463	6,102,935	681,445	324,494	5	64
Long Island	"	95	1,875,148	516,246	2,446,391	205,068	44,070	none	36
Ogdensburgh (Northern)	"	118	1,578,311	2,780,760	4,933,029	435,845	176,123	none	42½
Oswego and Syracuse	"	35	350,000	201,560	607,803	90,616	43,609	4	70
Rochester and Syracuse	"	184	5,132,990	700,123	6,016,778	988,366	549,824	8	154
Rutland and Washington	"	60	850,000	400,000	1,250,000	Recently	opened.	....	....
Saratoga and Washington	"	41	899,800	940,000	1,832,945	173,545	135,017	none	30
Syracuse and Utica	"	53	2,400,000	126,000	2,661,477	616,918	376,025	10	182
Troy and Rutland	"	32	237,690	100,000	329,577	Recently	opened.	....	33
Troy and Boston	"	39	430,936	700,000	1,043,357	Recently	opened.	none	....
Utica and Schenectady	"	78	4,124,000	none.	4,093,273	1,029,774	724,770	10	195
Watertown and Rome	"	96	1,011,940	650,000	1,693,711	225,152	116,706	8	109
Camden and Amboy	N. J.	65	1,500,000	.....	4,327,492	1,388,385	478,413	10	150
Morris and Essex	"	45	1,022,420	128,000	1,220,325	140,154	80,351	4	....
New Jersey	"	31	2,197,840	476,000	3,245,720	603,942	316,259	10	148
New Jersey Central	"	63	986,106	1,500,000	2,379,880	260,899	124,740	3½	....
Cumberland Valley	Penn.	56	1,184,500	13,000	1,265,143	118,617	76,890	5	....
Erie and North East	"	20	600,000	.....	750,000	Recently	opened.	....	125
Harrisburgh and Lancaster	"	36	783,950	688,051	1,609,494	200,249	106,932	8	....
Philadelphia and Reading	"	95	6,656,332	10,427,800	17,141,987	2,480,626	1,251,987	7	92¼

Railway Share List,

Compiled from the latest returns—corrected every Wednesday—on a par valuation of $100.

NAME OF COMPANY.		Miles open.	Capital paid in.	Funded debt.	Tot. cost of road and equipm't.	Gross Earnings in 1852.	Net earnings in 1852.	Dividend, 1852.	Price of shares.
Philad., Wilmington and Balt.	Penn.	98	3,850,000	2,403,276	6,813,839	667,785	383,501	5	71
Pennsylvania Central	"	250	9,768,153	5,000,000	15,600,000	1,943,827	617,625	....	100
Philadelphia and Trenton	"	30	....	....	....	....	....	....	....
Pennsylvania Coal Co	"	47	....	....	....	....	....	....	....
Baltimore and Ohio	Md.	381	9,188,300	9,827,123	19,542,307	1,325,563	615,384	7	73
Washington branch	"	38	1,650,000	....	1,650,000	348,622	216,237	8	....
Baltimore and Susquehanna	"	57	....	....	....	413,673	152,536	....	42
Alexandria and Orange	Va.	65	....	....	In prog.	....	....	....	....
Manassas Gap	"	27	....	....	In prog.	....	....	....	....
Petersburgh	"	64	....	....	....	....	....	....	....
Richmond and Danville	"	73	1,372,324	200,000	In prog.	....	....	....	....
Richmond and Petersburgh	"	22	....	....	....	....	....	....	....
Rich., Fred and Potomac	"	76	....	....	....	....	....	....	100
South Side	"	62	1,328,722	800,000	In prog.	....	....	....	....
Virginia Central	"	107	1,400,100	446,036	In prog.	176,485	74,902	none	....
Virginia and Tennessee	"	60	3,000,000	1,500,000	In prog.	....	....	none	....
Winchester and Potomac	"	32	180,000	120,000	416,532	89,776	....	12	....
Wilmington and Raleigh	N .C.	161	1,338,878	1,134,698	2,965,574	510,038	153,898	6	....
Charlotte and South Carolina.	S. C.	110	....	....	....	....	....	....	....
Greenville and Columbia	"	140	1,004,231	300,000	In prog.	....	....	....	....
South Carolina	"	242	3,858,840	3,000,000	7,002,396	1,000,717	609,711	7	125
Wimlington and Manchester.	"	....	....	....	In prog.	....	....	....	....
Georgia Central	Ga.	191	3,100,000	306,187	3,378,132	945,508	508,625	8	117
Georgia	"	211	4,000,000	1,214	....	934,424	456,468	7½	....
Macon and Western	"	101	1,214,283	168,000	1,596,283	296,584	153,697	9	109
Muscogee	"	71	....	....	In prog.	....	....	....	....
Southwestern	"	50	586,887	150,000	743,525	129,395	71,535	8	....
Alabama and Tennessee River	Ala.	55	....	....	In prog.	....	....	....	....
Memphis and Charleston	"	93	776,259	400,000	In prog.	....	....	....	....
Mobile and Ohio	"	33	879,868	....	In prog.	....	....	....	....
Montgomery and West Point.	"	88	688,611	....	1,330,960	173,542	76,079	8	....
Southern	Miss.	60	....	....	....	....	....	....	....
East Tennessee and Georgia	Tenn.	80	835,000	541,000	In prog.	....	....	....	....
Nashville and Chattanooga	"	125	2,093,814	850,000	In prog.	....	....	....	....
Covington and Lexington	Ky.	....	1,430,000	900,000	In prog.	....	....	....	....
Frankfort and Lexington	"	29	357,218	....	584,902	87,421	44,250	....	80
Louisville and Frankfort	"	65	....	....	....	....	....	....	....
Maysville and Lexington	"	....	....	....	In prog.	....	....	....	....
Cleveland and Pittsburgh	Ohio.	100	1,239,454	1,371,000	2,963,756	194,429	123,306	6	98¼
Cleveland, Painesv. and Ash.	"	71	....	....	....	....	....	....	....
Cleveland and Columbus	"	135	3,027,000	408,200	3,655,000	777,793	483,483	12	132
Columbus, Piqua and Indiana.	"	....	....	....	In prog.	....	....	....	....
Columbus and Lake Erie	"	61	....	....	....	....	....	....	....
Cincinnati., Ham. and Dayton	"	60	1,694,000	906,000	2,600,000	321,793	200,967	....	115
Cincinnati and Marietta	"	....	....	....	In prog.	....	....	....	....
Dayton and Western	"	40	310,000	550,000	925,000	Recently	opened.	....	80
Dayton and Michigan	"	20	....	....	In prog.	....	....	....	....
Eaton and Hamilton	"	36	....	....	....	....	....	....	
Greenville and Miami	"	31	....	....	....	....	....	....	....
Hillsboro	"	37	....	....	In prog.	....	....	....	....
Little Miami	"	84	2,370,784	....	2,634,157	526,746	314,670	10	119¼
Mansfield and Sandusky	"	....	900,000	1,000,000	1,855,000	....	....	....	....
Mad River	"	167	1,860,500	....	....	565,751	....	....	....
Ohio Cental	"	57	....	....	In prog.	....	....	....	....
Ohio and Mississippi	"	....	....	....	"	....	....	....	....
Ohio and Pennsylvania	"	187	1,750,700	2,450,000	....	Recently	opened.	....	....
Ohio and Indiana	"	....	....	....	In prog.	....	....	....	....
Scioto and Hocking Valley	"	....	....	....	"	....	....	....	....
Toledo, Norwalk and Clevel'd	"	87	552,000	800,000	1,317,140	Recently	opened.	....	150
Xenia and Columbus	"	54	1,092,137	119,500	1,257,714	237,506	135,363	15	....
Evansville and Illinois	Ind.	31	....	....	In prog.	....	....	....	....
Indiana Central	"	....	....	....	"	....	....	....	....
Indiana Northern	"	131	....	....	"	Recently	opened.	....	....
Indianapolis and Bellefontaine	"	83	....	....	"	....	....	....	....
Lawrenceburg and Ind	"	....	....	....	In prog.	....	....	....	75
Lafayette and Indianapolis	"	62	....	....	....	Recently	opened.	....	....
Madison and Indianapolis	"	88	1,650,000	750,000	2,400,000	516,414	268,075	10	97
Peru and Indianapolis	"	40	....	....	In prog.	....	....	....	....
Terre Haute and Indianapolis	"	72	632,387	663,100	1,353,019	106,593	71,446	4•	108
Rock Island and Chicago	"	....	....	....	....	....	....	....	....
Chicago and Mississippi	"	....	....	....	....	....	....	....	....
Illinois Central	Ill.	....	....	....	....	....	....	....	136
Galena and Chicago	"	92	1,932,361	500,000	In prog.	472,109	....	....	125
Michigan Southern	Mich.	315	2,499.410	2,629,000	6,430,246	592,187	293,046	....	128
Michigan Central	"	282	4,000,000	4,067,396	8,614,193	....	....	8	116¼
Pacific	Mo.	....	....	....	....	....	....	....	....

based, the character and objects of the road, etc., etc. Confidence in new works is a thing of *growth*, and of very slow growth. It proceeds in a legitimate manner, from the smallest beginnings, and does not spring at once into full luxuriance, no more than does a plant into full bloom. The security offered is one better adapted to a foreign than a domestic market, and might easily be sent abroad by some of our leading foreign houses.

The company, however, are in no immediate want of money, and will suffer no loss from the delay occasioned. The present movement will have a tendency to direct public attention to the project, and in this way will not be without beneficial results.

The receipts of the Michigan Central railroad for June show about 20 per cent. gain over June, 1852. The figures are—

	1853.	1852.
Passengers	81,825 56	63,669 15
Freight	37,607 88	35,567 25
Total	$119,433 44	$99,236 40
Increase	$20,197 04	

The increase is almost entirely in passenger traffic.

The revenue on the main stem of the Baltimore and Ohio Railroad for the month of June, amounted to about $190,000, being an increase of 56,000 over the receipts of the same month last year The revenue o the Washington Branch was $30,600, being a decrease of $6,182 as compared with the receipts of the preceding June. The following are the figures.

Main Stem.	Passengers.	Tunnage.	Total.
June 1853	$48,000	$142,000	$190,000
June 1852	27,515	105,348	132,863
Increase	$20,485	$36,652	$56,137

Washington Branch.

	Passengers.	Tunnage.	Total.
June 1853	23,500	7,100	30,600
June 1852	29.640	7,141	36,781
Decrease	$6,140	$41	$6,181

The receipts of the Harlem Railroad for June show an increase of over 20 per cent. on June of last year as follows :

	1852.	1853.
January	$45,601	$73,792
February	46,286	68,563
March	64,254	48,053
April	61,046	73,156
May	68,846	84,943
	$286,033	$319,507
June	66,699	80,951
Total	$352,732	$429,458
Increase		$76,726

The earnings of the Macon and Western Railroad Company for June were :

Passenger	$7,032 48
Mail	1,062 26
Freight	7,497 27
Total	$15,592 01
Corresponding month last year	16,469 58
Decrease	$877 57

The receipts of the Little Miami Railroad for the month of June, 1853, are $54,158 66
Jnne, 1852 43,945 57
Increase $10,213 09

The earnings of the Cincinnati, Hamilton and Dayton Railway for June 1853, compared with June 1852, are :

June	1852.	1853.
For Passengers	$16,315 16	$20,528 08
For Freight	7,676 44	10,905 00
For Mail and Express	104 55	869 85
Total	$25,096 15	$32,302 93

Increase more than 33 per cent...

The followng statement shows the condition and busineess of the Rutland and Burlington Railroad Company, for the year ending May 31, 1853.

The construction account amount to $5,577,466 82

The resources for these expenditures are stated to be:

Capital stock	$1,415,900 00	
Six per cent stock	571,000 00	
Eight per cent. stock.	500,000 00	
Morgage bonds	1,800,00 00	
Other bonds, floating debt, &c	1,190,566 82	
		$5,577,466 82
The entire earnings for the year are stated to be		495,397 45
The entire expenses, adding fuel and materials on hand		228,858 33
Leaving for net earnings		266,539 12
Exceeding those of the previous year by		101,109 40
Showing an increase of over 60 per cent		

The receipts of the Milwaukee and Mississippi railroad in June, show a large gain over the same month last year. They are:

	June, 1852.	June 1853.
Passengers	$2,969 91	$9,804 03
Freight	2,193 45	10,259 14
Total	$5,163 34	$18,563 19

In June 1852, only thirty-six miles of the road were in operation; in June 1853 70 miles. The business has more than *trebled*, while the number of miles in operation has been doubled. It is thought that with the extension of the road to Stoughton and Madison, next fall the monthly receipts will run up to $25,000 or $30,000. The receipts in May were $13,998 20.

At the annual meeting of the Hartford, Providence and Fishkill railroad company, held at Stonington, on the 27th ult., the old directors were re-elected. The net earnings from operations on road were:

For the year ending, first June 1853	$69,629 52
Do do do do 1852	60,119 04

The business of the United States Branch Mint at New Orleans, for the month of June, was as follows;

DEPOSITS.

California gold	$56,904 54
Foreign gold	931 98
Silver parted from California gold	302 01
Silver from other sources	206,830 95
Total value of deposits	$264,969 48

COINAGE.

Gold—gold dollars—85,000 pieces.... $85,000 00

The receipts of the Petersburg (Va.) railroad for the six months ending June 30 were $117,262 91, against $102,595 03 in the corresponding period last year. Increase $14,667 88. Out of the net earnings the company have declared a dividend of 8½ per cent.

The receipts of the Norwich and Worcester railroad company for June show a very handsome gain over the same month last year:

June 1853	$26,411 23
June 1852	21,919 53
Gain in 1853	$4,491 70

The directors have declared a dividend of 2 per cent, for the six months ending May 31, 1853, payable on the 18th inst. The dividend might have been larger, but the directors wish to be certain of a 3 per cent dividend in January.

The stockholders of the Philadelphia, Wilmington and Baltimore railroad met at Wilmington on the 30th June, when they accepted unanimously the act of the legislature of Maryland ceding to them the right of building a bridge over the Susquehanna, for which purpose they resolved to issue new stock at $40 per share.

The receipts of the Norwich and Worcester Railroad Company during the month of June, amounted to $26,411 23, against $21,919 53 for the corresponding period last year, showing an increase of $4,491 70—equal to 21 per cent.

Motive Power of the Boston and Providence Railroad.

The efficient and economical character of the Locomotive power of this road has led us to present our readers with a detailed report of its extent and condition.

This road was opened in 1834, with small engines from Robert Stephanson & Co. Edward Bury, and George Forrester & Co. of Newcastle and Liverpool; and with engines from the Locks and Canals company and William Norris of the United States. Three of the old engines are yet kept in ordinary by the company. The others have been sold, and are now distributed over some of the upper railroads, where they are used for gravel and wood trains.

In 1844 Mr. George S. Griggs, master of machinery, and one of the first engineers upon the line, commenced the construction of a new class of engines, with inside cylinders, straight, riveted, frames, "wagon top" furnaces, and coupled drivers, In 1845 the "Norfolk" was completed. In 1846 the Bristol," "Suffolk," and "Massachusetts" were furnished; the "Blackstone" in 1847; the "Taghconic," "Narragansett," "Iron Horse" and "Rhode Island," in 1848; the "Canton" and "Neponset" in 1849; the "Highlander" in 1850, the "Dedham" and "Roxbury" in 1851.

These were completed from time to time, as shown, to meet the increasing business of the road, and to provide for the deterioration of the old engines; so that by gradual progress the road is now stocked with a first class equipment of locomotives. Mr. Griggs is now engaged upon a new engine of larger size than upon any road running into Boston, and which is intended for the steamboat trains.

The characteristic of Mr. Griggs, engines, all of which are the same now as exhibited in the "Norfolk," are the heavy, straight frame, the outside bearing truck, lap valves, full stroke pumps, and for the rest a substantial and simple arrangement of the usual machinery, plainly finished, but accurately and strongly put together.

The iron of the outer shell of fire-box is ⅜ inch thick, the remaining parts of the boiler 5-16 inch. The boilers are generally stayed stronger than is usual among builders. Every engine on the road has a copper tube sheet at furnace end, and the "Iron Horse" "Rhode Island," "Canton," "Neponset," "Dedham" and "Roxbury" have whole furnaces constructed of copper. All the engines have tight fitting dampers, and have the common bonnet sparker. Every engine has a safety plug in the crown sheet of furnace. Every tube on every engine on the road is tight. The wood used is of a very good quality, which may be inferred from the fact of a consumption of but ¾ cord in running 41 miles, with five eight-wheel cars. The time, including 12 stops is one hour and three quarters. Part of the distance is up agrade of 45 feet per mile, in either direction of the road.

Three of Mr. Griggss engines were at the Locomotive trial at Lowell, October, 1st 1851; viz: the "Neponset," "Highlander," and the "Dedham." The "Neponset" was of the ordinary class of Passenger engines, with coupled drivers and lap valves. Her dimensions are shown in the table accompanying, She was not built purposely for speed and was sent as being merely a fair example of the every-day class of engines in use. The "Highlander" was an inside connected freight engine, having all the weight on six coupled drivers. The wheels had chilled tires. The dimensions are to be found in the table, below. The length of rectangle on rails is 12 feet 4 in. The middle and back pairs of wheels are 5 feet 3 in. apart between centers, the middle and front pairs 7 feet 1 in. There are, as is a necessary consequence in all engines of this arrangement of wheels, three tons more upon the forward pair of drivers than upon eithero of the others.

The "Dedham" is a small tank engine having but one pair of driving wheels. When the engine is at rest but 7-25ths of its weight are upon the driving wheels, but when drawing its load a portion of the weight upon the trailing wheels is transferred to the drivers through an arrangement of the draw-rod of the engine. This is effected in the following manner. The draw spring behind the engine is attached at its ends to long rods which run under the engine frames to near the driving axle, where they are attached to the lower ends of two bent levers, (one on each side of the engine), which are extended or have their fulcra in the frames, just back of the driving boxes. The ends of the horizontal arms of these levers lie directly upon the driving boxes so that the traction of the train is brought directly upon the boxes, to increase the adhesion with the resistance to be overcome.

The driving spring of the "Dedham" is laid across and is attached to the top of the boiler and rests at its ends upon pintals standing upon the driving boxes. There are one pair of driving, one pair of leading and one pair of trailing wheels The Drivers being 4 feet, 6 in. in diameter; the leading and trailing wheels 33 inches in diameter. The length of rectangle on rails is 11½ feet, being 5½ feet from center of drivers to leaders and 6 feet to trailing wheels. The weight on drivers when the engine is at rest is 7150 pounds,—the whole weight of the engine being 25350 pounds. For the arrangement of the drawing apparatuts of this engine Mr. Griggs was awarded a silver medal by the judges of the exhibition.

The "Neponset," after making the corrections in time due to her inferior weight and pressure of steam, when compared with the other engines tried, was the third in the order of speed out of six passenger engines tried, being 1½ tons lighter than any other, and having the smallest cylinders and lowest steam pressure of any tried. As a serviceable engine, running regularly with moderate repairs, and an economical consumption of fuel, the "Neponset" would compare with great credit

with any of the engines tried. The "Neponset" was then running with exhaust pipes of 2½ in. diameter, which are now worn or expanded to 2⅝ inch, something like 5/8 inch more than is usually maintained on engines of that class. As to their speed, Mr. Griggs' engines show the attainment of 50 miles per hour with the steamboat trains over the level parts of the road.

As to the "Highlander," we can only say that in many respects it is a successful and economical freight engine. The freight business of the Providence road is not so heavy as to furnish a complete test for the power of an engine, and had it been so, the "Highlander" would have probably had a separate cut off valve, so that steam could be used through full stroke in starting. For the service in which it is employed it is efficient and economical.

The economy of the chilled tire is fully realized in this engine, in the cheapness and facility of maintaining it in constant working condition.

The whole equipment of engines of this road is economically operated from the fact that the furnaces and tubes of every engine are in excellent order, and the proportions and adjustments of valves are good, thereby realizing the greatest efficiency of the fuel, while the expense of maintaining is very low from the strength of the frames, the strong staying and bracing of the boiler, the simplicity of the pumps, slides and valve motions, the excellent quality of the springs, the simple sparker, etc., etc. The machines are simple, durable and accessable.

It may be interesting to know something of the extent and position of the establishment from which this road has been equipped with engines. The passenger in the Providence and New York trains will observe a low range of brick buildings near to and upon the north side of the track, about a mile from the Boston station, These are the engine house and repair shops. The machinery of the latter consists of a small stationary engine of six horse power; one large lathe for turning drivers; one boring and splining lathe for trucks and car wheels; seven small iron frame engine lathes; two wood frame lathes; two hand lathes; two drills; two small iron planers; one bolt cutter; one axle-key-way cutter, and fifteen iron vises. By comparing this machinery with that of other repair shops, it will be found not to exceed the amount required to keep the same number of locomotives in repair, but on the Providence road this machinery has sufficed to build nearly the whole equipment of engines, four having been built in one year. Thirty men are the most that have ever been employed in the entire establishment, including men engaged in repairing cars. The boiler smith's work is obtained, completed, from other shops, the Taunton Company having built most of the boilers and tender tanks.

Mr. Griggs is now building an engine with 16 inch cylinders, 18 inch stroke, 5½ feet drivers, 128 two inch solid brass tubes, 12 feet long; copper fire-box with copper stay bolts; separate cut off valve, etc. This will soon be completed and placed on the steamboat train.

SURVEY OF MOTIVE POWER. BOSTON AND PROVIDENCE RAILROAD.—BY ZERAH COLBURN.

Name of Engine.	Builder.	Reception on Road.	Cylinder Connection.	Diam. of Cylinder.	Length of Stroke.	Length of Ports.	Width of Steam Port.	Width of Exhaust.	Diam. of Drivers.	No. of Drivers.	No. of Trucks.	Diameter of Boiler.	Length of Tubes.	Number of Tubes.	Diameter of Tubes.	Diam. of Blast-pipe.	Length of Furnace.
				in.	in.	in.	in.	in.	ft. in.			in.	ft. in.		in.	in.	in.
Whistler	R. Stephenson & Co.	June, 1834	Inside.	12	16	8	1	2	5. 0	Two.	Four.	34	9. 9	76	2 3-16	1 9-16	25½
Boston	Edward Bury.		"	12	20	8	1	2	5. 0	"	Two.	36	7. 8	76	2¼	1⅝	23
Tiot	Locks & Canals Co.		"	12	16	8	1	2	5. 0	"	Four.	34	9. 9	66	2 3-16	1⅝	32
King Philip	"		Outside.	16	20	8	1	2½	4. 6	Four.	"	45	9. 0	135	1¾	1 13-16	37
Norfolk	G. S. Griggs	May, 1845	Inside.	14 7-16	18	8½	1	2	4. 7	"	"	38	9. 6	116	"	1 13-16	31½
Bristol	"	May, 1846	"	14⅝	18	8½	1	2	5. 0	"	"	38	9. 6	121	"	1⅞	30½
Suffolk	"	June, "	"	14 9-16	18	8½	1	2	5. 0	"	"	38	9. 6	121	"	1⅞	31½
Massachusetts.	"	Dec. "	"	14 11-16	18	8½	1	2	5. 0	"	"	41	9. 9	131	"	1⅞	33¼
Blackstone	"	April, 1847	"	14¾	20	8½	1	2	5. 0	"	"	41	9. 9	135	"	1⅞	33¾
Taghconic	"	Jan'y. 1848	"	14¾	18	9	1	2	5. 6	"	"	40½	10. 0	135	"	2 1-16	34½
Narragansett	"	Feb'y. "	"	16	20	9	1	2	4. 6	"	"	40	10. 0	135	"	1⅞	33
Iron Horse	"	Sept. "	"	14 13-16	18	9	1	2	5. 0	"	"	42½	11. 0	134	"		33½
Rhode Island	"	" "	"	14 11-16	20	9	1	2	5. 6	"	"	42½	11. 0	134	"		33½
Canton	"	May, 1849	"	14¾	20	9	1	2	5. 6	"	"	42	11. 0	135	"	2⅛	35
Neponset	"	June, "	"	14¾	20	9	1	2	5. 6	"	"	41×43	11. 0	123	2	2⅝	35
Highlander	"	June, 1850	"	14¾	18	9	1	2	4. 0	Six.	None.	45	9. 4	142	1¾	1 15-16	33
Dedham	"	May, 1851	"	9	16	7	⅞	1¾	4. 6	Two.	Four.	30¾	8. 0	113	1½	1½	20½
Roxbury	"		"	9	16	7	⅞	1¾	4. 6	"	"	30¾	8. 0	113	"	1½	20½
Providence	Taunton Company.	Feb. 1849	"	15	18				5. 0	Four.	"	43	10. 0	129	1¾	1⅞	37

Width of Furnace.	Depth of Furnace.	Weight of Engine in running order.	Weight on Drivers.	Weight of Tender filled.	Area of Tubes.	Area of Furnace.	Area of Grate.	Steam used at 1 revolution of Drivers.	Revolutions of Drivers per mile.	Steam used pr. mile.	Relative amount of Steam used by each engine.	Traction of engine in tons load.	Adhesion equal to tons load.	Wood space in Tender.	Water room of Tend.	Cubic feet in both Cylinders.	Tube surface to each cubic ft. of both cyl.	Fire-box surface for Do.	Area of Grate for do.	Weight on drivers for Do.	Actual weight on each driving wheel.	Actual weight on each truck wheel.
in.	in.	lbs.	lbs.	lbs.	sq. ft.	sq. ft.	sq. ft.	cub. ft.		cub. ft.		tons.	tons.	cords.	galls.		sq. ft.	sq. ft.	sq. ft.	lbs.	lbs.	lbs.
45	38				406	42	8. 0	4. 2	336	1407	5814	288		⅞	800	2.09	194	20.0	3.8			
41½	42				343	40	7. 7	5. 2	336	1759	7268	360		¾	780	2.62	131	15.3	2.9			
42	39½				368	39	6. 7	4. 2	336	1407	5814	288		⅞	908	2.09	176	18.7	3.2			
42	54				557	66	10. 8	9. 3	374	3481	14381	711		1¾	1893	4.65	120	14.2	2.3			
40	40	34460	20555		505	45	8. 7	6. 8	367	2503	10341	512	411	1½	1358	3.41	148	13.1	2.6	6027	5139	3476
40	46¾	35705	21705		527	50	8. 5	7. 0	336	2352	9716	481	434	1½	1355	3.50	150	14.4	2.4	6201	5426	3500
40	40	35805	21050		527	45	8. 7	6. 9	336	2332	9633	477	421	1½	1354	3.47	152	12.9	2.5	6066	5262	3689
37¾	48				585	52	8. 7	7. 1	336	2372	9800	485		1½	1253	3.53	166	14.7	2.5			
40	43				603	49	9. 4	7. 9	336	2658	10980	544		1½	1269	3.95	153	12.5	2.4			
40	49½	41500	26480		618	56	9. 6	7. 1	306	2179	9000	445	530	1½	1526	3.56	174	15.9	2.7	7438	6620	3755
40	44	40100	24000	28800	618	49	9. 2	9. 3	374	3481	14381	711	480	1½	1526	4.65	133	10.6	2.0	5161	6000	4025
39½	45				675	51	9. 2	7. 2	336	2412	9966	494		1⅜	1281	3.59	188	14.1	2.6			
39½	45	44507	28307		675	51	9. 2	7. 9	306	2421	10000	495	566	1⅜	1286	3.95	171	12.9	2.3	7166	7077	4050
39	50				680	57	9. 5	7. 9	306	2421	10000	495		1¼	1471	3.95	172	14.3	2.4			
39	50	43050	28000		708	56	9. 5	7. 9	306	2421	10000	459	560	1¼	1471	3.95	179	14.2	2.4	7088	7000	3762
39	47¼	41200	41200		607	52	8. 9	7. 1	420	2990	12353	612	824	1⅛	1430	3.56	171	14.5	2.5	11573		
32	38	25350	7150		358	29	4. 5	2. 4	374	881	3640	180	143	½	300	1 18	303	24.8	3.8	6059	3575	
32	38				358	29	4. 5	2. 4	374	881	3640	180		½	300	1.18	303	24.8	3.8			
39	46	44400	28000	28400	591	54	10. 0	7. 4	336	2474	10220	506	560	1⅜	1531	3.68	161	14.8	2.7	7609	7000	4100

The areas of tubes are estimated from their outside diameter. The area of fire-box includes so much of its internal surface as is in actual contact with the water. The area of grate is the area of horizontal section of furnace at the level of grate bars. The traction is estimated from a pressure of 75 lbs. per square inch on piston throughout stroke. Adhesion is taken as one-fifth the weight on drivers. Friction of train at 10 pounds per ton. Amount of steam used does not include what is lost in ports.

NOTES.

All tenders, excepting the "King Philip's" have rubber springs; none have draw springs; all but the tender of the "Providence" have safety chains to suspend the brake beams. The "Bristol," "Taghconic," "Iron Horse," "Rhode Island," "Providence," "Neponset," and "Highlander" have Miller's brakes, by which the strain upon the brakes is equalized.

Only the "Narragansett," "Providence," "Dedham" and "Roxbury" have sand-boxes.

"Rhode Island" and "Neponset" have steam brakes upon the driving wheels.

"King Philip," "Providence," "Narragansett" and "Rhode Island" have separate cut-off valves.

All have strong and secure cow-catchers.

Railway Axles.

The following communication on the manufacture of Railway axles was addressed to the Editor of the *Toledo Blade*. It contains important suggestions and deserves perusal.

Mr Editor—Having witnessed the unfortunate accident to the cars of the Michigan Southern Rail Road, which occurred yesterday by the breaking of an axle; and having had a good deal of experience in making car axles myself, I thought I would, through the medium of your columns, lay before the public, my views on the whole subject of manufacturing axles.

The ordinary, and almost universal method of making axles, is, from what is techinically called piles. These piles are bars of iron about 6 inches wide and one inch thick. Six of these laid together, forming a square mass of 6 inches are put into a furnace, ond when brought to a high welding heat, so that they stick together, are rolled out into a bar, about 1-4 of an inch longer than the axle is to be when finished. This round bar is permitted to cool, and afterwards heated to a bright red, or mild white heat, when it is hammered in dies, and finished to the requisite size of the axle.

To this axle there are several serious objections.

1st. It is made of bars of iron welded together, and consequently, besides the risk of insufficient welding, it is tough only as it bends in two directions; either up or down the flatway of the bars. When it comes to be bent the edgeway of the bars, it is comparatively brittle. To see the force of this objection, it is only necessary to take an ordinary cut nail, and bend it with the grain of the iron and then across the grain, until it broke.

2. The bars of which it is made are not all of them through bars. Some of them, usually two or three in each mass, are pieces of various lengths, laid in, the ends butted against each other.—This of course, as bars of iron will not weld endways, weakens the axle from 1-4 to nearly 1-2, these short pieces contributing very little else besides bulk and weight to the axle.

3. The hammering of these axles, besides being one of the most shameless humbugs in the world, is a positive injury to the axle. Every one who ever worked in iron knows that the hammer is the best instrument yet discovered to purge iron, and hence the partiality so universally exhibited for hammered iron. But it is equally well known to all iron men, that in order to benefit iron in the manner named the iron must be hammered when first taken out of knobling fires or puddling furnace, while it is in a loose, soft spongy state. To hammer iron at a later stage of the progress of manufacturing it, does but little good; and to hammer it in the way that axles are hammered does harm—Every blow struck by the hammer after it falls in temperature below a *bright* red heat destroys, to some extent, its fibrous character, and if continued long enough, will change it entirely into granulous. It has been demonstrated that a heavy bar of the toughest iron in the world, by repeated blows in the same place from but a light hammer, will give way and fall assunder.—Such being the case, what must be the injury to a railroad axle which receives all its hammmering while passing from a mild white to a dull red heat, cooled down, too, in the process, by water thrown almost constantly on it while being hammered, to give it a fine skin and beautiful finished. The hammering of railroad axles amounts to a planish and no more, and is a direct and positive injury to the axle. The writer can remember some thirty years ago, when the planished iron was first introduced in the west. From its beautiful appearance, it was popular for a while, but in less than two years nobody would have it. Planishex axles are deserving of unspeakable less confidence, be cause the polish endangers the lives of thousands of men, women and children.

4th. So long as axles are made in the present manner, it is but reasonable to expect that a portion of the bad iron—larger or smaller, according to the cupidity of the manufacturer—will enter into their composition.

There would be but little risk in stating it as a fact that a majority of the railroad axles in use were made of all puddled iron, and but very few of them all of the best of iron. Those made of all puddled iron are wholly unfit for use. Our government will not use a pound of puddled iron, and yet our railroad companies consent to use it even for axles.

Those not made entirely of puddled iron, are, many of them, mixed—a streak of fat and a streak of lean—half and half, perhaps.

The four objections presented in the foregoing, are—

1st. The axles in question are made of piles.
2d. These piles are not all through.
3d. They are injured by hammering.
4th. The material of which they are made is not good enough.

Having stated the objections to the present method of making axles, the writer would suggest an objection to the present mode of putting wheels on axles. It is well known that almost every axle that breaks, breaks at the journal. Why is this? The reason is that the shoulder on the journal is made to act as a fulcrum, while the spring on the axle furnishes a lever.

The wheel is driven home against the shoulder, fitting it as closely and tightly as it is possible for the best mechanic to bring iron and iron together. As the axle springs in the middle, it must, of necessity, bear hard against the wheel on the one side, while it draws equally hard on the other.

There is, therefore, a constant and very heavy and continually varying strain on the neck or journal of the axle, which, in time, cannot fail to break it. Fasten a nail or other piece of iron as tightly as a wheel is fastened on a railroad axle, and then spring it backwards and forwards continually, and see if it will not give away by and by.

Now all these objections can easily be remedied. First, let railroad companies contract with responsible manufacturers of blooms of acknowledged and uniformly good quality, for blooms each of the requisite size to make an axle such as they want; and Secondly, let these blooms be delivered by the manufacturer at some rolling mill and rolled down to the size wanted. If a spring is requested, rolls can be turned so as to give the bar that shape.

By pursuing this course all danger from bad iron bad welding, short piles and injurious hammering will be avoided, The axle althrough will be in fact and to all practical intents and purposes a hammered axle. The hammering will be given at the right end of the process.—Besides an axle will be equally tough whichever way it be strained. There will not be, to use a common phrase, any "crossway of the pile."

One axle of this sort will be worth more for service and reliability than a dozen of the ordinary kind.

The wheels should be fastened on without a shouldier and thus avoid the strain to which they are subjected by the present plan.

In presenting these views, the writer feels that he has nothing to gain except perhaps, increased safety to himself, family and friends in travelling.

Samuel Church.

Pacific Railroad.

We have received the third annual report of the directors of this company, which presents the following exhibit of its affairs to March 21st, 1853.

The total amount subscribed to the capital stock to date is over $2,800,000. This is exclusive of stock taken by contractors, the amount of which will appear upon the final settlement of their contracts. It is also exclusive of subscriptions for the South Western and Iron Mountain branches,—but a considerable part of it is conditional upon certain locations of the road west of Jefferson City.

The amount of instalments called in to the date of report was 50 per cent. of which $609.965 have been paid.

The total expenditures to March 21st 1853 were $1,378,487,85. Floating debt about $75,000. Amount of state bonds received, $650,000.

The following is an abstract of the Trial Balance presented in the report.

DEBITS.

Balance due on subscriptions.....	$915,385 00
Interests, Exchange and Discounts.	41,515 12
Lands, Damages and Grants.....	172,561 65
Surveys.....	61,112 19
Labor and materials for road construction.....	963,341 90
Building and Machinery.....	59,028 38
Cars and Engines.....	59,102 97
Water supply.....	1,957 24
Office expenses and Contingencies...	19,868 40
Balance in hand for unsettled accounts.....	9,606, 16
	$2,303,479 01

CREDITS.

Capital Stock subscription.....	$1,502,350 00
Bills payable.....	11.128 69
Capital Stock paid up.....	23,000 00
Samuel Copp Jr., *Treasurer*.....	90,244 27
State of Missouri for Bonds.....	650,000 00
Premium on Bonds.....	26,756 05
	$2,303,479 01

The total estimates for the first division of 37 miles, based upon payments already made and to be made is $1,461,971 08, or an excess of $269,-674 08 above the estimate made on location of June, 1851; and $161,800 08m ore than the revised estimate of Feby. 1852. Of this excess, $67,000 were for outlays not contemplated upon the original location. The excess has been owing to resistance upon the part of land-owners, to the prevelance of cholera, and the inefficiency of contractors. Difficulties have been encountered as severe as any of the eastern roads, and these facts account for the delay in opening the eastern division. But what has been done is of a permanent and first class character.

Most of the equipment has been purchased at the east and put together at St. Louis, but, contracts are now made for the construction of cars and locomotives in that city. It was expected to pass over the first division, with a train, on July first.

The second division will reach Jefferson City, 125 miles from St. Louis. It is now located through Grays Gap to the Valley of the Missouri in which it is continued to Jefferson City. The work to within 15 miles of Jefferson City will be principally in side hill, there being also one tunnel. The estimate for preparing the road bed for the track for this division, 88 miles, is $1,500,000.

Early in 1852 the people of Washington County residing in the great mineral region of the State applied to this company to build a branch to the Iron Mountain and Pilot Knob, upon which the board deemed it proper to pledge the company to its construction when half of its cost should have been subscribed in stock. A route was surveyed to leave the main line near the end of the first division and passing by the way of Calve Creek along the ridge near Potosi, through Washington County to the Iron Mountain. Length of branch 60 miles, or making a distance from St. Louis to the Iron mountain of 100 miles.

The people of Washington County, subscribed $110,000. Upon these facts the legislature granted a loan of the state credit for $750,000, which, by subsequent act, may be transferred at any time by the Company to the Iron Mountain Co. That Co. pany are now engaged in making surveys indepen. dently of those surveyed by the Pacific Company which prevents the latter company from taking any steps in the matter until the result of these surveys are known.

The national grant of land made June 10th 1852, to the state of Missouri, was transferred Dec. 25th, 1852, by the State to this company on condition that it should be applied to the construction of a branch road terminating on the western boundary south of the Osage river, and $1,000,000 of state credit is added to the grant, provided $500,000 applicable to the branch, in addition to the capital stock of the company, should be subscribed before any of those bonds should issue.

The same act defines the Pacific Railroad to be a railroad running from St. Louis, *via* Jefferson City, and thence on the most practicable inland route through the county of Johnson and terminating at any point in Jackson County which the Company may designate. But this location through Johnson County is upon the condition that the people and counties interested upon that line shall within twelve months, from the passage of the act, subscribe at least $400,000 additional to the amounts then subscribed, and that the Company shall be able to secure the right of way on as good terms as upon any other route. If the conditions are not complied with within the twelve months, the Company are authorized to select any other route. The same act extends the credit of the State to the amount of another million of dollars, making the total loan to this Company *four millions of dollars*, and limits the period of completing the road to Jackson County to five years from the passage of the act. The company are also exempted from taxation on both their lines until the same are respectively completed, opened, and declare a dividend; but to be subject to taxation two years after they are completed whether they declare a dividend or not. To the Pacific Railroad running to Jackson County is also applicable that portion of the land grant which shall be due to that portion of the road lying between St. Louis and the point where the South-Western Branch shall diverge.

Before the passage of this act preliminary surveys of the south-western route had been made by this Company, and also of a route through the cities of Boonville and Lexington, and were reported to the Legislature, with a memorial and map of the State showing all the moneys of this company, of all which 15,000 copies were printed and circulated by the General Assembly.

The estimates of the Engineer, based upon these preliminary surveys from the end of the First Divi sion, to complete the road, are as follows:

PACIFIC RAILROAD TO JACKSON COUNTY.

Length, *via* Boonville and Lexington to the boundary..... 254.81 miles.
Cost..... $6,576,000.
Length, *via* Johnson County, to the boundary..... 243.73 miles.
Cost..... $6,200,000.

SOUTH WESTERN BRANCH.

Length from the end of First Divi-sion.. 310 miles.
Cost..... $7,800,000

These estimates are exclusive of rolling stock and land damages.

The location of the South-western branch was commenced as soon as a practicable after the passage of the act of December 25th, with a view of securing the location and title of the lands. If the full quantity of vacant land granted shall be found within the limlis prescribed by the law this Company will obtain 3,800 acres per mile, or about 1,300,000 acres for the weole liue. The grant, properly managed, is a highly valuable gift to this Company, and it is hoped may be so used as to secure the evrly completion of the South-western branch throughout and be of no inconsiderable assistance to the construction of the line to the Kanass also. Negotiations, having this grand object in view, have been already started.

The following is the conclusion of the report. "Congress at its recent session appropriated $150,000 to the survey of routes from a railroad across the continent, to connect the Atlantic States with the Pacific. This is in fact the beginning of the great Pacific railroad, and it now behoves us to push on both our lines with increased energy, so that we shall be in a position to reach that road whatever route for it may be adopted. Our line to the south-west looks to the direction of the Canadian and the southern route, while our line to the Kanzas points to the central and also to the northern route. Our Legislature have granted this Company the right to extend their road to any point west of the boundary, even to the Pacific. Our position is therefore favorable for an inevitable connection with the National Pacific Road. If it should happen that a route should be adopted nected with either of our lines, the stock of this Company will certainly be a prize. Looking to the probabilities in our favor, and the munificent grant of lands made to this Company, as well as to the general position and relations of our road, the stock of this Company must be admitted to be of most excellent promise.

The guage adopted by this Company (5 feet 6 inches) has been adopted as the gauge of the Missouri, and it has been adopted by the New Orleans Great Western Railroad, which is looking to a connection with our road and with the road to California. It is highly important that this should be the guage of the railroads west of the Mississippi."

The folllowing is the organization for 1853.

Directors.—Hudson E. Bridge, James E. Yeatman, John C. Rust, Thomas Allen, Daniel D. Page, Henry L. Patterson, Edward Welsh, D. A. January, Josuah B. Brant, James Harrison, Alban H. Glasby, Luther M. Kennett, Richard S. Elliott.

President.—Thomas Allen.

Vice President.—L. M. Kennett.

Secretary and Treasurer.—Samuel Copp, Jr.

Engineer in Chief.—Thomas S. O'Sullivan.

Journal of Railroad Law.

FORWARDERS AND CARRIERS.

The receipts taken from the agents of transportation merchants should distinctly show with whom we are dealing, so that we can estimate how far we are secure, and if it prove necessary, obtain legal indemnity in case of loss. The litigation of which a brief sketch is subjoined, grew out of that loose mode of doing business which the hurry of modern travel so often occasions. It should be remembered that the *mere forwarder* is only bound to exercise ordinary care in fulfilling the duties entrusted to him. It is in dealing with the *common carriers* alone that we protect our goods from all casualities, except those occasioned by the act of God or the public enemies. If the forwarder is also a common carrier, he is of course, subject to all the duties and liabilities of the common carrier.

The following case was lately tried before judge Barculo, of our supreme court, at Brooklyn, *Thurman against Wells, Fargo, and others.*

The defendants formed "the California Express Company." The action was brought to recover 202 ounces of gold and 22 gold pieces lost from the steamer Georgia, at Kingston, Jamaica, on her passage from Aspinwall to New York, in October last.

The gold in question had been delivered by one A. Spencer—the original owner—to Backus, defendants agent, to be carried ashore at Panama, before the arrival of the said parties in that city, whither they had sailed from California. The parties crossed the Isthmus together, and meanwhile the gold remained in the trunk of Backus. On reaching Aspinwall they agreed that the gold should be carried to New York in the Georgia, in Backus' trunk. The latter deposited parcels belonging to other individuals in his trunk, and placed it in his state room. The trunk was robbed at Kingston, both parties being ashore. The following points were debated on the trial:

1st. Was the money delivered to Backus individually, or was it delivered to him as agent of the Express Company?

2d. Was the defendant a mere forwarder, and were the owners of the Georgia, therefore, the only parties liable for the value of the gold?

3d. Admitting the original claim against the defendants to be valid, could the claim be assigned so that the present plaintiff to whom it had been assigned, could recover?

The court was of opinion that the evidence was sufficient to show a delivery to Backus, as agent of defendants, and also decided the remaining

points against defendants. The jury accordingly rendered a verdict for plaintiff for the full value of the gold.

HOW FAR IS THE NEGLIGENCE OF AN INJURED PARTY A BAR TO HIS RECOVERING DAMAGES?

The rule governing this subject was thoroughly discussed by judge Bosworth, of the Superior court in May last, in the case of *Carrol vs. the N. York and New Haven Railroad company.* Carrol was injured by a collision between two of the defendants trains, and this collision was a very culpable one. The plaintiff at the time was in the post office department of the baggage car, which, as he knew, was a much more dangerous location than any passenger car; yet his riding in the baggage car, had not been objected to by the conductor. Had he staid in a passenger car he would have escaped injury. There was no evidence that any notice was posted in the baggage car excluding passengers therefrom nor any notice prescribed by the session laws of 1850.

Was the defendant's negligence of such a nature as falls within the rule that "whenever it appears that the plaintiff's negligence or wrongful act had a material effect in producing the injury, he is not entitled to recover?"

The court decided that the conduct of the plaintiff did not fairly come within this rule. And the following is a summary of Judge Bosworth's reasoning on the subject.

The defendants were bound to exercise the most scrupulous care to prevent collisions, and the plaintiff was under no obligation to select a seat in order to avoid the possible consequences of their neglect of that duty.

The defendants should so run their trains as to avoid collisions. Where an injury is inflicted on a passenger directly by means of a collision which might have been avoided, if the notices specified in the session laws of 1850 are not affixed as prescribed by that act, the injured party may recover even though he be in the baggage car, if there with the knowledge, and without objection from the conductor.

The only answer the defendants can make is "our gross negligence would not have injured you if you had been in a car set apart for passengers, which, as is well known was the safest place in the event of a collision." The injured party may properly reply, "I owed no duty to you requiring me to guard against the possibility of your running two trains together."

It is the doctrine of the case of Munger vs. the Tonawanda railroad company—4 Coms. 349—and of all the cases cited by defendants that one party cannot recover from another damages for an injury when his own wrong *contributed to the occurrence which caused the injury*, and if his own wrong did not contribute to the occurrence which caused the injury, the party occasioning it is liable.

In Blyth vs. Topham—Cro. Jac. 158—the plaintiff's mare was straying in a common in which she had no right to be, and fell into a pit which defendent had dug, and was killed. It was held that plaintiff could not recover. The plaintiff's wrong in suffering his mare to go upon the common contributed to the occurrence which caused the injury in her falling into the pit.

Similar to this was the case of Bush vs. Brainard, 1 Comer, 78, where plaintiff's cows straying unlawfully at large, killed themselves by drinking defendants' maple syrup. The plaintiff was defeated.

In Sarck vs. Blackburn—4 C. & P.—brought to recover damages for being bitten by a dog, chained in defendants' yard.—Chief Justice Tindal told the jury,—"the case will turn on the question, whether the plaintiff had a right to be on the spot."

The same doctrine is sustained in the following cases: Blackman vs. Simmons, 3 Carr, and P. 138. Howland vs. Vincent, 10 Met. 371. Cook vs. the Transportation Champ. Co. 1 Denio 91.

Judgment for plaintiff was affirmed with costs.

It will be perceived that the principle of the foregoing is as follows:

If a passenger lawfully selects his seat in a train of cars, no indiscretion in selecting it will exonerate the company from liability for injuries resulting from a collision caused by the gross negligence of their servants.

Mississippi and Missouri Railroad.

On the 27th day of May last, the persons associated in the organization of this Company, met at Chicago, Ills., and the required amount of capital stock having been subscribed, the Company was duly organized by an election of the following board of directors, viz.—

John A. Dix, of New York, Prest.; Wm. B. Ogden, of Chicago. Vice Pres't.; Wm. Walcott, of Utica, Jos, E Sheffield, of New Haven, Henry Farnam, of Chicago, Thomas P. Durant, of New York, Ebenezer Cook of Davenport Directors. Azariah C. Flagg, of New York, Treasurer; Henry Farnam, Chief Engineer; John E. Henry, of Chicago. Secretary, and N. B. Judd, Solicitor.

After a complete organization of the Board, the Directors adjourned to meet at this place on the first Monday of the present month.

The news of this organization reached here in advance of the gentlemen belonged to the Company, and inspired us anew in this grand undertaking.

On the first Monday in June, an informal meeting was held by Messrs. Wolcott, Farnam, Ogden and Judd at this place, and after consulting with our citizens, they visited Muscatine and Iowa City, meeting in their route gentlemen from Cedar and Linn, counties, returning here Wednesday evening to meet a mass meeting of our citizens at the Court House.

At this morning a proposition was made to build the main trunk of the Road via Iowa City, with a branch through Cedar county up the valley of Cedar river to Cedar Rapids, in Linn county.

This being a new proposition, our citizens appointed a committee of five to confer with the Directors and report the next evening to an adjourned meeting. This proceeding resulted in the adoption of the following arrangement:

The Stock holders met and amended the charter so as to allow the building of the three Roads by the same company, and increased the Directors from seven to nine. Thereupon the Directors met and unanimously elected George Green, of Cedar Rapids, and Thomas M. Isett, of Muscatine as the two additional Directors.

This organization was not completed when our paper went to press last week, neither had those interested been fully advised of the matter in detail, consequently we did little more than publish the action of the meeting at the Court House, and the propositions pending.

On Wednesday evening of last week the committee of five reported to a large and respectable meeting of citizens and strangers, that they had unanimously agreed upon the amended organization, herein before stated. After an interesting interchange of opinions and good feeling, in which Mr. Ogden, of Chicago, Mr. Woodward, of Muscatine, Mr Byington, of Iowa City, and Judge Grant participated, the proposition was unanimously adopted.

Thus, after years of bitter local feelings between the towns in Central Iowa, cool heads, stout hearts and *long* purses have accomplished an object for which they deserve the lasting gratitude of the people of Central Iowa. By this arrangement this county and Johnson, with such assistance as they can get along the route hence to Iowa City, have to raise $350,000; and just so soon as it is done, the contract for the first division of the Road will be let, and the work commenced in thirty days.

Our citizens have taken hold of this work with a will and an earnestness that augurs a triumphant success. The meeting last Saturday evening in front of the Le Claire building, went off right, and nothing is required to insure success but a determination on the part of every one to "help out," and see that our share of the stock is taken before they cease to act.

The news all along the three routes is cheering, and the whole of Central Iowa for the first time is actively at work in a common cause. Why should they not? What reason can any man give for refusing to take stock?

A little more than two years ago our citizens were called upon to take stock in the Rock Island and La Salle Road. It was something new, and we did not know who our Eastern friends were, nor how far we could confide in them, yet we *tried* them, and what has been the result? They have never made us a promise, nor held out an inducement with which they have not strictly complied. They are pushing that Road to completion in advance of their contract time; the stock is now par, although no part of the Road has as yet been turned over to the company.

The same gentlemen with others propose to build our Roads west, if we but comply with our part of the undertaking. Let us do it; let us act as a unit in extending heart and hand to men who have done so much for us, and propose still further to expend their millions among us, and for us.—*Davenport Gazette.*

Wood Gas.

The city of Wilmington, North Carolina, is now, for its size, the cheapest lighted city in the United States. The whole apparatus, including mains, gasometers, &c., cost but $18,900. This includes their transportation, with, also, the pay and passage of workmen. By reference to Ure's Chemical Dictionary, a standard work, it will be found a ton of coal, or thereabouts, yields about 10,000 cubic feet of gas. This is after eight hour's distillation from the best selected coal. By actual experiments it has been found that a cord of wood will produce 93,000 cubic feet of gas. It will be perceived at once this renders wood gas much cheaper. Besides, it is a well ascertained fact that in the production of light the ligneous oils are as 7 to 8 superior to that of coal. One reason that they have been so little used is, that they require to be distilled from wood previous to use; but this difficulty, it is said, has been obviated by a simple and cheap apparatus, invented and patented by Dr. McConnell. This invention places the use of gas within the reach of all rural villages, and will render every one who choses to be so, independent of the gas companies, for by its means they can manufacture their own gas, at a much cheaper rate than it can now be supplied by any company chartered within the United States.—This gas has not the offensive smell of that produced by coal, and can be passed directly from the retort through the washer or condenser to the gasometer without further purification.

This discovery promises to open a new field of commerce; the vast amount of pine in Lower Virginia and North Carolina, now considered of no value, will be brought into market for the purpose of manufacturing gas, and the charcoal left after destructive distillation, will pay the whole expense of manufacturing. Wood can be purchased in North Carolina, and delivered at Wilmington, or in Pamlico Sound, for one dollar per cord; the transportation, &c, would not bring the cost up byeond four dollars. Wood at five dollars per

cord, yields 93,000 cubic feet. An apparatus for manufacturing wood gas could be put up for one-seventh the cost of that for manufacturing coal gas. It is estimated that the city of New York might be lighted for one dollar per thousand feet, and yield a handsome profit to the manufacturers; whereas this city now pays three dollars per thousand.—*Evening Post.*

[That good gas can be made from wood is a fact, and one as long and well known as that it can be made from oil, bitumen and coal. It is also true that a ton of coal produces about 10,000 cubic feet of gas, but the amount which can be produced by a cord of wood we do not know, as one kind of wood will produce more gas than another. More gas can certainly be produced from resin than from wood, and yet gas can be made from coal at a less cost We are positive that no 93,000 cubic feet of good gas can be made from a cord of wood; 1,000 cubic feet will be nearer the mark. We have no doubt but in some places where good resinous, pine wood is cheap, gas can be made economically, but if any of the other woods in our forests is used, we believe its gas will have to be washed with turpentine before it can be made suitable for illumination.

We do not hesitate to pronounce the statement respecting "making gas from wood for one dollar a thousand cubic feet in this city," a grossly erroneous allegement. A cord of dry pine wood does not weigh 2,000 lbs. (pitch pine 1,904 lbs.) it contains 49.95 carbon, 6.41 hydrogen, and 43.64 oxygen. Good bituminous coal yields 74.823 carbon, 6.180 hydrogen, and only 5.085 of oxygen. As oxygen and hydrogen are very volatile, if they exist in a large proportion in any matter employed in making gas in wood, it is evident that they will quickly pass off when the wood is put into the retort and not take up the carbon in the wood, which is essential to the making of good gas; the product therefore will be a poor watery gas in comparison with that produced from coal, and besides there will be produced a great quantity of watery acid, and other matters not fit for illumination. Light carburetted hydrogen, the gas made from coal and used in cities, contains no oxygen, its composition is CH2, and it is the excess of hydrogen in the coal which takes up some carbon—the latter not being volatile in itself, but it is left in the retort—and makes the gas. The excess of oxygen in wood—it not being an element of the illuminated gas—renders it altogether inferior for making gas for cities. A cord of wood then cannot produce as much gas as a ton of bituminous coal, and therefore it would be more expensive to use it for that purpose excepting where it is very cheap and coal dear.

It has been found that 12½ parts of hydrogen can combine with as much carbon as 100 parts of oxygen; in wood there are about 10 parts of oxygen to 1 of hydrogen, while in coal there is 1 of hydrogen to .80 of oxygen. We would therefore expect that one ton of good cannel coal would produce ten times more good illuminating gas than a cord of wood.—*Scientific American.*

Lexington and Frankfort Railroad.

The fifth annual report of this company, made up to May 1st. 1853, presents the following account of its operations for the 12 months preceeding that date.

RECEIPTS.

From Passengers	$38,773 01
" Freights	46,608 06
" Mail	2,040 62
	$87,421 79
Deduct expenses for same period	43,250 99
Leaving as profit	$44,170 70
Number of miles run	61.944
Receipts per mile run	$1,41 00
Expenses " " "	68 82
Ratio per cent. of expenses to receipts	48 57

The total cost of the road and equipments up to the present time exclusive of interest paid is $584,901,07 or about $20,000 per mile. The nett debt of the company is now $137,112,77, which is a reduction of $25,634,01 from the indebtedness at the time of the last report.

Railroad Iron.

623 Tons T Rails of good quality, 59 lbs. to the yard to arrive during July, for sale by
29tf JOHN H. HICKS, 90 Beaver st.

Notice to Contractors.

PROPOSALS for the Grading, Masonry and Bridging of portions of the Girard and Mobile railroad, will be received at the Railroad Journal Office, New York, on the 8th of August next.

Plans, Profiles and other required information will be furnished at that time. The entire length of the road is 225 miles; commencing at Girard, in Russell County, on the west bank of the Chattahirchu river, opposite Columbus, Ga., and running to Mobile, 52 miles south of Girard, is under contract, 23 miles nearly complete. The amount of subscription up to date is $2,766,000. The probable cost of the road is $4,000,000.

That portion of the line between Greenville and Mobile (115 miles) will be placed under contract as soon as the Mobile subscription of $1,000,600 becomes available.

ROBT. S. HARDAWAY, President.
GEO. S. RUNEY, Chief Engineer.
Girard Railroad Office, 6th July, 1853.

Lawrence Scientific School. Harvard University.

CAMBRIDGE, MASS.

THE next term of this Institution will open on the first day of September, 1853, and continue 20 weeks.

Instruction by recitations, lectures and practical exercises, according to the nature of the study, will be given in—

Astronomy	by Messrs.	Bond.
Botany	" Prof.	Gray.
Chemistry, Analytical and Practical	" "	Horsford.
Comparative Anatomy and Physiology	" "	Wyman.
Engineering	" "	Eustis.
Mathematics	" "	Pierce.
Mineralogy	" "	Cooke.
Physics	" "	Lovering.
Zoology and Geology	" "	Agassiz.

For further information concerning the School, application may be made to Prof. E. N. Horsford, Dean of the Faculty.

Cambridge, July 15, 1853.

Notice to Contractors.

FREMONT AND INDIANA RAILROAD.

SEALED PROPOSALS will be received at the Engineer's Office, in Fremont, until the 20th day of July next, at noon, for the Grubbing Clearing, Grading, Masonry, Bridging and Cross Ties for said road, from Fremont to Lima; sixty-six miles.

The line will be divided into sections of about one mile each, and bids will be received for one or more, or the whole.

Propositions for completing the entire line ready for business, are also invited.

The Company reserve the right to reject any and all proposals that are not considered satisfactory.

This road, running through a populous and healthy country, where supplies are cheap and abundant, offers unusual inducements to Contractors.

Maps, Profiles, Plans and Specifications, will be ready for examination on and after the 15th day of July.

A. BROOKS, *Chief Engineer.*
Fremont, O., June 23rd, 1853.

Machine Shop for Rent.

FIXTURES AND VALUABLE TOOLS FOR SALE.

THE premises now occupied by Bancroft & Sellers, elegibly situated in Kensington, Philadelphia Co. fronting the Delaware, and adjoining the extensive Foundry of Messrs. Reany, Neafie & Co.) rae offered for Rent. Possession given on or about 1st October, 1853.

The Machine shop is a three story substantial brick building, 40 by 80 feet, well lighted on all sides, and conveniently arranged, with office, store room and drawing room. There is an excellent direct action vertical Steam Engine of 10 Horse power in the building, occupying but little space, and supplied with steam from two 30 inch boilers, 30 feet long, situated outside. The building is heated throughout with wrought iron steam-pipe, so arranged as to use the exhaust steam from the Engine or live steam direct from the boilers.

The two principal rooms have each a complete line of shafting extending their whole length. In the lower room is a large Slide Lathe, capable of turning over 9 feet in diameter, also a first rate planing Machine, capable of planing an object 5 feet wide and 32 feet long. These machines are both placed on substantial mason work, and together with the shafting, steam pipe, and sundry other fixtures, will be sold at reasonable prices. The Smith Shop is a substantial, well lighted one story brick building, 30 by 60 feet, containing 5 forges, and all the usual appliances. There is also on the premises one large frame setting up shop; one frame ware-room for castings; one frame store room for finished work, with room over for storing dry lumber. The yard room is ample and conveniently arranged for Coal, Iron &c. &c.,

For Terms apply to S. B. GRICE, 17 Walnut st. Philadelphia or.

JOSEPH GRICE 36 Water st.
1m New York.

To Contractors.

SEALED PROPOSALS will be received at the Engineer's Office of the Pittsburg, Maysville, and Cincinnati Railroad, in M'Connellsville, until the 20th July, for the Graduation and Masonry of the line of road (about 35 sections) between the Muskingum river and the Central Ohio Railroad.

Bids enclosing proper testimonials, will be received for the whole or any number of the above sections.

Plans and specifications will be ready for examination after the 10th of July.

The division between the Muskingum and Hocking rivers will be offered for contract, as soon as the location is completed. ROB'T M'LEOD,
Chief Engineer.
M'Connellsville, June 4th, 1853.

Railroad Letting.

KENOSHA AND BELOIT RAILROAD.

ON and after the first day of August next, and until the 15th of August, inclusive, proposals will be received, under seal, at the Office of the Kenosha and Beloit Railroad company, in Kenosha, for the construction of the entire road from Kenosha to the Rock River Union Valley Railroad, a distance of about 50 miles.

The proposals may be made for the grading, masonry, ties, and entire construction in a single contract—or for the same and all items separately. and in independent contracts by different individuals. They will likewise be received for the above in parts. The work will besides be divided into sections of moderate length, and proposals, as above, for a single section or any number of sections will be received.

Profiles and specifications may be inspected at the Engineer's Office in Kenosha, on and between the days above specified, and forms of proposals will be supplied to all who desire to take contracts.

ALEX. C. TWINING, Engineer,
Engineer's Office, Kenosha, June 20th.

$1,250,000 Bonds of the New orleans, Opelousas and Gre at Western Railroad Co.

SEALED PROPOSALS will be received until the 15th of September next, at the office of HEWITT, LEES & Co., in the city of New York, for the purchase of 1250 Bonds of One Hundred Thousand Dollars each, all dated 1st August, 1853, and payable at the office of the company in the city of New Orleans, as follows, to wit:

250 Bonds of $1000 each, on the 1st August, 1854.
250 do do do, do 1st August, 1855.
250 do do do do 1st August, 1856.
250 do do do do 1st August, 1857.
250 do do do do 1st Ausust, 1858.

Sealed Bonds bearing interest at the rate of seven per cent per annum from date, interest payable semi-annually, at the office of the company in New Orleans, with coupons for same attached. Said bonds are issued by order of the Board of Directors, the proceeds of which, to be expended in the construction of the road.

The New Orleans, Opelousas and Great Western Railroad company was organized 1st May, 1852. Its present capital, by act of Incorporation, is $6,000,000. Its charter provides for the construction of a trunk railway from the city of New Orleans, westwardly, to some point on the boundary between the States of Louisiana and Texas, favorable for its extension across the latter State to the Pacific ocean.

The entire line or first division of road to Washington, in the parish of St. Landry, 173 miles with a branch of 20 miles in addition, is now under contract with parties of the highest responsibility, and is to be entirely completed by the first day of January 1855.

The rails are already laid for 20 miles, and 66 miles will be finished and in operation on the first of January next.

The cost of the division to Washington, complete, with equipments, depots, etc., etc.. will be $3,300,000.

The tributaries to the division of the road under contract, and to the probable line of its extension to the limits of the State, are the Bayous Lafourche, Terrebonne, Black, Teche, Vermillion, Courtablean, Bœuf, Robert, Rapide, Cotile, Red and Sabine Rivers.

The Parishes traversed by it, embrace portions of the deltas of the Mississippi and Red Rivers, and the magnificent prairies of the Attakapas and Opelousas forming the finest planting and grazing region of the South. Besides other and abundant resources, both for travel and transportation, they produced last year 126,309 hhds of sugar, and about 7.580,000 gallons of molasses, being more than half of the entire crop of the State, export annually about 40,000 head of live stock, about 300,00 bales of cotton reach this terminus by the present channels of commerce tapped by this line of road, or grown in the country penetrated by ti.

The subscriptions to the capital Stock of the Company now amount to the sum of $4,243,600, as follows, viz;

Individual subscription	$1,063,000
Municipal corporations, payable part in. five and part in six annual payments, viz:	
City of New Orleans	$1,500,000
Parish of Orleans	75,000
Do St. Mary	156,600
Do St. Martin	103,775
Do Lafayette	33,400
Do St. Landry	115,625
Do Natchitoches	250,000
Do DeSoto	100,000
	$2.334.400
	$3,397,400

At the last session of the Legislature the State of Louisiana subscribed one-fifth of the capital stock of the company, viz: $1,200.000, payable, however, only in the same proportion as other subscribers, consequently the actual State subscription at this time is $846,200, making our present available subscription amount to the sum of $4,243,600.

The bonds now ofered for sale are secured by special pledge, according, to law, of the subscription to the capital stock made by the city of New Orleans, viz. $1,250,000, due 1st June 1854 to 1858, inclusive, $250,000 per annum; and the interest on said Bonds is secured by pledge of unmatured installments of the Parishes of Orleans, St. Mary, St. Martin and Lafayette amounting to $300,240.

The Board of Directors in offering this loan to the public, do so with full confidence that the security offered is of the most undoubted character No mortgage of any kind now exists upon the property of the company, and the Board do not contemplate to issue any Bonds secured by mortgage upon the Road until the line to Washington is complete and in working order, a distance of 173 miles, and then the amount of funds to be raised by mortgage will be but a very moderate amount compared with the actual cost and value of the Road, and will be employed in its further extension.

The subscription of the City of New Orleans is payable annually, by a tax levied on the whole landed estate of the city, authorized not only by an act of the Legislature, but approved by the tax-payers, and declared legal and constitutional by the supreme Court of the State. The security therefore, for the payment of said subscription, is the entire landed estate of the City of New Orleans, amounting to One Hundred Millions of Dollars. Payers of this tax receive an equal amount in the stock of the company.

For all further information in regard to this loan, apply to Messrs Hewitt, Lees & Co., New York, or at the office of the company, New Orleans.

By order of the Board.

J. H. OVERTON. Pres't.

New Orleans, June 1853.

"Gardner's Rock Drill."

DESIGNED for Tunnelling, Quarry use, and Rock Excavations of all descriptions, by the use of which a saving of 50 to 75 per cent is made.

Applications for Territorial Rights and Machines must be made to the Patentee. G. ARTHUR GARDNER, Trinity Buildings, Broadway, New York.

June 9, 1853.

AMOSKEAG MANF'G CO.

MANUFACTURERS of LOCOMOTIVE and STATIONARY STEAM ENGINES, Boilers, Cotton and Woolen Machinery, Tools, Turbine Wheels, Mill Work and Castings of every description.

MANCHESTER, N. H.

WM. AMORY, *Treasurer*, 65 State st., Boston, Mass. O. W. BAYLEY, *Agent*, Manchester, N. H. 1y jy 6.

CENTRAL RAILROAD CO.

OF NEW JERSEY.

$950,000 of Stock.

BY ORDER of the Board of Directors, the Finance Committee of the Central Railroad Co. of New Jersey will open Books of Subscription for the Unissued Stock of the Company, amounting to $950,000, at the BANK of AMERICA, in the City of New York, on the 27th June instant, and keep the same open one week, unless the whole amount shall be sooner subscribed. This Stock comprises all that the Company are entitled to issue, and the money received is to be applied to the construction of a second track, improvements at Elizabethport, and other preparations imperatively demanded by the connections to be opened in another year. This mode of distribution has been adopted, in preference to a pro rata allotment, to enlarge the number of stockholders, and facilitate the acquisition of stock by those now desirous but unable to procure it.

The Ferry, 12 miles, from New York to Elizabethport, and the Railroad, 63 miles, from Elizabethport to Easton, Pa., have been operated thro' the entire distance for nearly a year, and both are fully equipped for the present business. Passengers preferring the land route can go from New York by the way of Newark to Elizabethtown and there intersect the trains.

From the terminus at Easton, the Lehigh Valley Railroad is in active course of construction to Mauch Chunk, 46 miles, and will be opened in July, 1854, connecting New York, winter and summer, with the Lehigh coal fields, by a route of only 125 miles; the Lehigh road having only descending or level grades, and the Central Road no grade over 21 feet to the mile. At Tamaqua the Lehigh road connects with the Catawissa road, now constructing, and to be completed in May, 1854. This connects with the Sunbury and Erie road, now under contract and to be completed in two years. Thus the year 1855 will see a new route of favorable grades and curves only 462 miles in length, opening from New York to Erie on Lake Erie.

A direct and favorable connection with Pittsburg and the Pennsylvania Central Railroad, can also be made through existing roads and charters.

From New Hampton, a point on the Central Railroad of New Jersey, 59 miles from New York, the Warren Branch road in connection with the Delaware, Lackawanna and Western road and the Oswego, Syracuse and Binghamton road, will bring the Lackawanna coal region within 133 miles of New York, with grades of only 21 feet to the mile (except for a few miles in leaving the coal basis at Scranton), and give an unbroken line of six feet gauge, 310 miles in length, from New York to Oswego on Lake Ontario. Of this distance, 156 miles are finished and in operation; 80 miles are under construction and to be opened this Fall; the remaining 74 miles are located, contracted, and to be completed in the Fall of 1854.

It may be interesting to state that the Central Railroad of New Jersey, from its local business, without any of the anticipated connections, has been enabled to pay seven per cent on the cost of the several sections as they have been opened, and that the entire road, with its present local business, is now paying dividends at that rate.

At the close of the fiscal year, April 1, 1853, the financial condition of the company was as follows:

Capital stock	$1,034,700 00
Mortgage bonds, 7 per cent	1,500,000 00
Other bonds, 6 per cent	113,000 00
Bills payable and balance due	249,022 04
Balance of earnings over dividend..	1,006 85
	$2,897,728 89

This was represented by the following property:

Railroad, average $37,800 per mile.	$2,379,886 64
Ferry interest and boats	140,900 00
Station houses, shops, etc.	78,000 00
Land at Elizabethport	55,016 77
Equipment	218,504 64
Materials, wood, coal, cash, etc	25,420 84
	$2,897,728 89

Full statements of the condition of the company can be obtained at the office, 5 Wall street, where those desirous to examine the road with reference to investment can procure tickets for the trip.

The Finance Committee call the attention of capitalists with the greatest confidence to the present position and future prospects of the road, believing that no road in this vicinity presents greater inducements for investment. They reserve the right to reject or reduce subscriptions, if the whole amount subscribed should exeed the amount to be issued.

Ten per cent will be required to be paid on allotment of the stock, and the remainder in instalments of ten per cent every sixty days on notice, as required. Interest at the rate of seven per cent will be allowed till the instalments have all been called. If the dividends on the full stock are at a higher rate, the difference will be made good to thh scrip Stockholders when their stock is filled up.

Dated New York, June 17, 1853.

JOHN T. JOHNSTON,
JOHN C. GREEN,
WILLIAM E. DODGE,
WILLIAM S. WETMORE,
} Finance Committee.